MOTT MACDONALD

Expansion of Hong Kong International Airport into a Three-Runway System

Construction Phase Quarterly EM&A Report No.7 (1 July to 30 September 2017)

October 2017

Airport Authority Hong Kong

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This Construction Phase Quarterly EM&A Report No. 7 has been reviewed and certified by

the Environmental Team Leader (ETL) in accordance with

Section 15.4 of the Updated EM&A Manual

Certified by: 

Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date 20 December 2017

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By Email

Airport Authority Hong Kong
HKIA Tower, 1 Sky Plaza Road
Hong Kong International Airport
Lantau, Hong Kong

Attn: Mr. Lawrence Tsui, Principal Manager

20 December 2017

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Quarterly EM&A Report No.7 (For 1 July 2017 to 30 September 2017)

Reference is made to the Environmental Team's submission of Quarterly EM&A Report No.7 (For 1 July 2017 to 30 September 2017) under Condition 15.4 of the Updated EM&A Manual certified by the ET Leader on 20 December 2017.

We would like to inform you that we have no adverse comment and verify the captioned submission.

Should you have any query, please feel free to contact the undersigned at 3922 9376.

Yours faithfully,
AECOM Asia Co. Ltd.

Jackel Law
Independent Environmental Checker

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Executive Summary

The "Expansion of Hong Kong International Airport into a Three-Runway System" (the Project) serves to meet the future air traffic demands at Hong Kong International Airport (HKIA). On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the Project was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual.

This is the 7th Construction Phase Quarterly EM&A Report for the Project which summarizes the monitoring results and audit findings of the EM&A programme during the reporting period from 1 July 2017 to 30 September 2017.

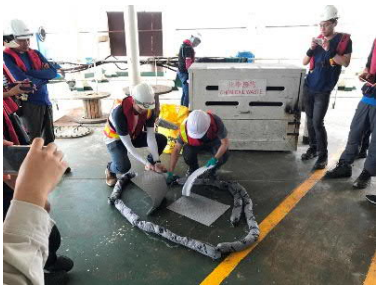
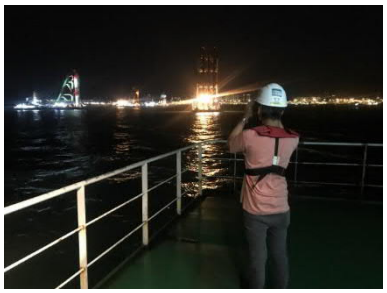
Key Activities in the Reporting Period

The key activities of the Project carried out in the reporting period included deep cement mixing (DCM) works and trials, laying of geotextile and sand blanket, site preparation works, site office establishment, seawall construction, horizontal directional drilling (HDD) works, concrete removal works, piling, and excavation works.

EM&A Activities Conducted in the Reporting Period

The EM&A programme was undertaken in accordance with the Updated EM&A Manual of the Project. A summary of the monitoring and audit activities during this reporting period is presented as below. Construction works, and thus terrestrial ecological monitoring on Sheung Sha Chau Island was resumed in August 2017 after the end of the ardeid's breeding season (between April and July).

Monitoring/ Audit Activities	Number of Sessions
1-hour Total Suspended Particulates (TSP) Air Quality Monitoring	102
Noise Monitoring	65
Water Monitoring	40
Vessel line-transect surveys for Chinese White Dolphin (CWD) monitoring	6
Land-based theodolite tracking survey effort for CWD monitoring	15
Terrestrial ecology monitoring	2

		
Chemical Spill Drill conducted by Contractor	Dolphin Exclusion Zone (DEZ) Monitoring for DCM Works conducted by Contractor	Dolphin Observer Training

In total, 2,170 High Speed Ferry (HSF) movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. All HSFs travelled through the Speed Control Zone (SCZ) with average speed within 15 knots, which complied with the Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier (the SkyPier Plan). Two ferry movements had minor deviations from the diverted route during the reporting period. ET investigated the deviation cases and confirmed that all of them are related to public safety / emergency situations.

On the implementation of the Marine Travel Routes and Management Plan for Construction and Associated Vessel (MTRMP-CAV), the Marine Surveillance System (MSS) automatically recorded deviation cases such as speeding, entering no entry zone, and not travelling through the designated gates. ET conducted bi-weekly audit of the system to ensure sufficient information has been provided and the contractors complied with the requirements of the MTRMP-CAV. Trainings were provided for the concerned skippers to facilitate them in familiarising with the requirements of the MTRMP-CAV. Deviations including speeding in the works area, entry from non-designated gates and entering no-entry zones were reviewed by ET. All the concerned captains were reminded by the contractor's Marine Traffic Control Centre (MTCC) representative to comply with the requirements of the MTRMP-CAV. Monthly 3-month rolling programmes for construction vessel activities were provided by contractors for checking to ensure the proposed deployment is necessary and minimal through good planning.

On the implementation of Marine Mammal Watching Plan (MMWP), dolphin observers were deployed by the contractors for laying of open sea silt curtain and laying of silt curtains for sand blanket in accordance with the plan. On the implementation of DEZ Plan, dolphin observers at 12 to 16 dolphin observation stations were deployed for continuous monitoring of the DEZ by the contractors for DCM works and seawall construction in accordance with the DEZ Plan. Trainings for the proposed dolphin observers were provided by the ET prior to the aforementioned works, with the training records kept by the ET. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine mammals were observed within or around the silt curtains, whilst there were four records of dolphin sighting within the DEZ of DCM works in this reporting period. Audits of acoustic decoupling for construction vessels were also carried out by ET.

Review of Environmental Quality Performance Limits (Action and Limit levels)

No exceedance of Action or Limit Levels in relation to construction dust, construction noise, construction waste, and CWD monitoring was recorded in the reporting period.

The water quality monitoring results for total alkalinity and chromium obtained during the reporting period did not trigger their corresponding Action and Limit Levels stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme if being exceeded. For DO, turbidity, suspended solids (SS), and nickel, some of the

testing results exceeded the relevant Action or Limit Levels in the reporting period, and the corresponding investigations were conducted accordingly. The investigation findings concluded that the exceedances were not due to the Project.

Implementation Status and Review of Environmental Mitigation Measures

Weekly site audits were carried out during the reporting period to confirm the implementation measures undertaken by the contractors. Environmental issues related to construction activities, air quality, noise, water quality, waste management, terrestrial ecology, landscape & visual and CWD were monitored and/ or reviewed.

Recommended environmental mitigation measures, as included in the EM&A programme, were implemented properly during the reporting period. The EM&A programme effectively monitored the construction activities and ensured proper implementation of the mitigation measures.

Summary Findings of the EM&A Programme

The following table summarizes the key findings of the EM&A programme during the reporting period:

	Yes	No	Details	Analysis / Recommendation / Remedial Actions
Breaches of Limit Level^		✓	No project-related Limit Level exceedance was recorded.	Nil
Breaches of Action Level^		✓	No project-related Action Level exceedance was recorded.	Nil
Complaints Received	✓		Two complaints were received on 8 August and 5 September 2017 respectively.	Complaint investigations were carried out in accordance with the Complaint Management Plan. Investigation details are presented in S3.2.1.
Notification of any summons and status of prosecutions		✓	No notification of summons or prosecution were received.	Nil
Changes that affect the EM&A		✓	There was no change to the construction works that may affect the EM&A	Nil

Remarks: ^Only exceedance of Action or Limit Level related to Project works is counted as Breaches of Action or Limit Level.

1 Introduction

1.1 Background

On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the "Expansion of Hong Kong International Airport into a Three-Runway System" (the Project) was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual (the Manual) submitted under EP Condition 3.1. The Manual is available on the Project's dedicated website (accessible at: http://env.threerunwaysystem.com/en/index.html). AECOM Asia Company Limited (AECOM) was employed by AAHK as the Independent Environmental Checker (IEC) for the Project.

The Project covers the expansion of the existing airport into a three-runway system (3RS) with key project components comprising land formation of about 650 ha and all associated facilities and infrastructure including taxiways, aprons, aircraft stands, a passenger concourse, an expanded Terminal 2, all related airside and landside works and associated ancillary and supporting facilities. The existing submarine aviation fuel pipelines and submarine power cables also require diversion as part of the works.

Construction of the Project is to proceed in the general order of diversion of the submarine aviation fuel pipelines, diversion of the submarine power cables, land formation, and construction of infrastructure, followed by construction of superstructures.

The updated overall phasing programme of all construction works was presented in Appendix A of the Construction Phase Monthly EM&A Report No. 7 and the contract information was presented in Appendix A of the Construction Phase Monthly EM&A Report No. 21.

1.2 Scope of this Report

This is the 7th Construction Phase Quarterly EM&A Report for the Project which summarizes the key findings of the EM&A programme during the reporting period from 1 July 2017 to 30 September 2017.

1.3 Project Organisation

The Project's organisation structure is provided in **Appendix A.** Contact details of the key personnel have been updated and provided in **Table 1.1**.

Table 1.1: Contact Information of Key Personnel

Party	Position	Name	Telephone
Project Manager's Representative (Airport Authority Hong Kong)	Principal Manager, Environment	Lawrence Tsui	2183 2734
Environmental Team (ET)	Environmental Team Leader	Terence Kong	2828 5919

Party	Position	Name	Telephone
(Mott MacDonald Hong Kong Limited)	Deputy Environmental Team Leader	Heidi Yu	2828 5704
	Deputy Environmental Team Leader	Keith Chau	2972 1721
Independent Environmental Checker (IEC) (AECOM Asia Company Limited)	Independent Environmental Checker	Jackel Law	3922 9376
	Deputy Independent Environmental Checker	Roy Man	3922 9376
Advanced Works:			
Contract P560(R) Aviation Fuel Pipeline Diversion Works (Langfang Huayuan Mechanical and Electrical Engineering Co., Ltd.)	Project Manager	Wei Shih	2117 0566
	Environmental Officer	Lyn Liu	5172 6543
Deep Cement Mixing (DCM) Works:			
Contract 3201 DCM (Package 1) (Penta-Ocean-China State-Dong-Ah Joint Venture)	Project Director	Tsugunari Suzuki	9178 9689
	Environmental Officer	Alan Tam	6119 3107
Contract 3202 DCM (Package 2) (Samsung-Build King Joint Venture)	Project Manager	Ilkwon Nam	9643 3117
	Environmental Officer	Dickson Mak	9525 8408
Contract 3203 DCM (Package 3) (Sambo E&C Co., Ltd.)	Project Manager	Eric Kan	9014 6758
	Environmental Officer	David Hung	9765 6151
Contract 3204 DCM (Package 4) (CRBC-SAMBO Joint Venture)	Project Manager	Kyung-Sik Yoo	9683 8697
	Environmental Officer	Kanny Cho	6799 8226
Contract 3205 DCM (Package 5) (Bachy Soletanche - Sambo Joint Venture)	Deputy Project Director	Min Park	9683 0765
	Environmental Officer	Margaret Chung	9130 3696
Reclamation Works:			
Contract 3206 (ZHEC-CCCC-CDC Joint Venture)	Project Manager	Kim Chuan Lim	3693 2288
	Environmental Officer	Kwai Fung Wong	3693 2252
Terminal 2 Expansion Works:			

Party	Position	Name	Telephone
Contract 3501 Antenna Farm and Sewage Pumping Station (Build King Construction Ltd.)	Project Manager	Osbert Sit	9079 7030
	Environmental Officer	Kelvin Cheung	9305 6081
Contract 3502 Terminal 2 APM Depot Modification Works (Build King Construction Ltd.)	Project Manager	Kivin Cheng	9380 3635
	Environmental Officer	Chun Pong Chan	9187 7118
Automated People Mover (APM) Works:			
Contract 3602 Existing APM System Modification Works (Niigata Transys Co., Ltd.)	Project Manager	Kunihiro Tatecho	9755 0351
	Environmental Officer	Arthur Wong	9170 3394
Airport Support Infrastructure and Logistic Works:			
Contract 3801 APM and BHS Tunnels on Existing Airport Island (China State Construction Engineering (Hong Kong) Ltd.)	Project Manager	Tony Wong	9642 8672
	Environmental Officer	Fredrick Wong	9842 2703

1.4 Contact information for the Project

The contact information for the Project is provided in **Table 1.2**. The public can contact us through the following channels if they have any queries and comments on the environmental monitoring data and project related information.

Table 1.2: Contact Information of the Project

Channels	Contact Information
Hotline	3908 0354
Email	env@3rsproject.com
Fax	3747 6050
Postal Address	Airport Authority Hong Kong HKIA Tower 1 Sky Plaza Road Hong Kong International Airport Lantau Hong Kong Attn: Environmental Team Leader Mr Terence Kong c/o Mr Lawrence Tsui (TRD)

1.5 Summary of Construction Works

Key activities of the Project carried out in the reporting period included DCM works and trials, laying of geotextile and sand blanket, site preparation works, site office establishment, HDD works, concrete removal works, piling, and excavation works.

The locations of the works areas are presented in **Figure 1.1** to **Figure 1.2.**

1.6 Summary of EM&A Programme Requirements

The status for all environmental aspects is presented in **Table 1.3**. The EM&A requirements remained unchanged during the reporting period.

Table 1.3: Summary of Status for All Environmental Aspects under the Updated EM&A Manual

Parameters	EM&A Requirements	Status
Air Quality		
Baseline Monitoring	At least 14 consecutive days before commencement of construction work	The baseline air quality monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
Impact Monitoring	At least 3 times every 6 days	On-going
Noise		
Baseline Monitoring	Daily for a period of at least two weeks prior to the commencement of construction works	The baseline noise monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
Impact Monitoring	Weekly	On-going
Water Quality		
General Baseline Water Quality Monitoring for reclamation, water jetting and field joint works	Three days per week, at mid-flood and mid-ebb tides, for at least four weeks prior to the commencement of marine works.	The baseline water quality monitoring result has been reported in Baseline Water Quality Monitoring Report and submitted to EPD under EP Condition 3.4.
General Impact Water Quality Monitoring for reclamation, water jetting and field joint works	Three days per week, at mid-flood and mid-ebb tides.	On-going
Initial Intensive Deep Cement Mixing (DCM) Water Quality Monitoring	At least four weeks	Completed in May 2017. Data analysis in-progress.
Regular DCM Water Quality Monitoring	Three times per week until completion of DCM works.	On-going
Waste Management		
Waste Monitoring	At least weekly	On-going
Land Contamination		
Supplementary Contamination Assessment Plan (CAP)	At least 3 months before commencement of any soil remediation works.	To be submitted with the relevant construction works.
Contamination Assessment Report (CAR) for Golf Course	CAR to be submitted for golf course first; programme for submission of supplementary CAR at the other areas to be agreed.	The CAR for Golf Course was submitted to EPD.
Terrestrial Ecology		
Pre-construction Egretry Survey Plan	Once per month in the breeding season between April and July, prior to the commencement of HDD drilling works.	The Egretry Survey Plan was submitted and approved by EPD under EP Condition 2.14.

Parameters	EM&A Requirements	Status
Ecological Monitoring	Monthly monitoring during the HDD construction works period from August to March.	The ecological monitoring has been resumed since August 2017.
Marine Ecology		
Pre-Construction Phase Coral Dive Survey	Prior to marine construction works	The Coral Translocation Plan was submitted and approved by EPD under EP Condition 2.12.
Coral Translocation	-	The coral translocation was completed on 5 January 2017.
Post-translocation Monitoring	As per an enhanced monitoring programme based on the Coral Translocation Plan	On-going
Chinese White Dolphins (CWD)		
Baseline Monitoring	6 months of baseline surveys before the commencement of land formation related construction works. Vessel surveys: Two full surveys per month; Land-based theodolite tracking: Two days per month at the Sha Chau station and two days per month at the Lung Kwu Chau station; and Passive Acoustic Monitoring (PAM): For the whole duration of baseline period.	Baseline CWD results were reported in the CWD Baseline Monitoring Report and submitted to EPD in accordance with EP Condition 3.4.
Impact Monitoring	Vessel surveys: Two full surveys per month; Land-based theodolite tracking: One day per month at the Sha Chau station and one day per month at the Lung Kwu Chau station; and PAM: For the whole duration for land formation related construction works.	On-going
Landscape and Visual		
Baseline Monitoring	One-off survey within the Project site boundary prior to commencement of any construction works	The baseline landscape & visual monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
Impact Monitoring	Weekly	On-going
Environmental Auditing		
Regular site inspection	Weekly	On-going
Marine Mammal Watching Plan (MMWP) implementation measures	Monitor and check	On-going
DEZ Plan implementation measures	Monitor and check	On-going
SkyPier High Speed Ferries (HSF) implementation measures	Monitor and check	On-going
Construction and Associated Vessels	Monitor and check	On-going

Parameters	EM&A Requirements	Status
implementation measures		
Complaint Hotline and Email Channel	Construction phase	On-going
Environmental Log Book	Construction phase	On-going

Taking into account the construction works in the reporting period, impact monitoring of air quality, noise, water quality, waste management, terrestrial ecology, landscape and visual, and CWD were carried out in the reporting period. Upon completion of coral translocation in January 2017, a summary of the ensuing post-translocation monitoring is reported quarterly.

The EM&A programme also involved weekly site inspections and related auditing conducted by ET for the checking of implementation of required environmental mitigation measures recommended in the approved EIA Report. In order to enhance environmental awareness and closely monitor the environmental performance of the contractors, environmental briefings and regular environmental management meetings were conducted.

The EM&A programme has been following the recommendations presented in the approved EIA Report and the Manual. A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix B**.

2 Environmental Monitoring and Auditing

2.1 Air Quality Monitoring

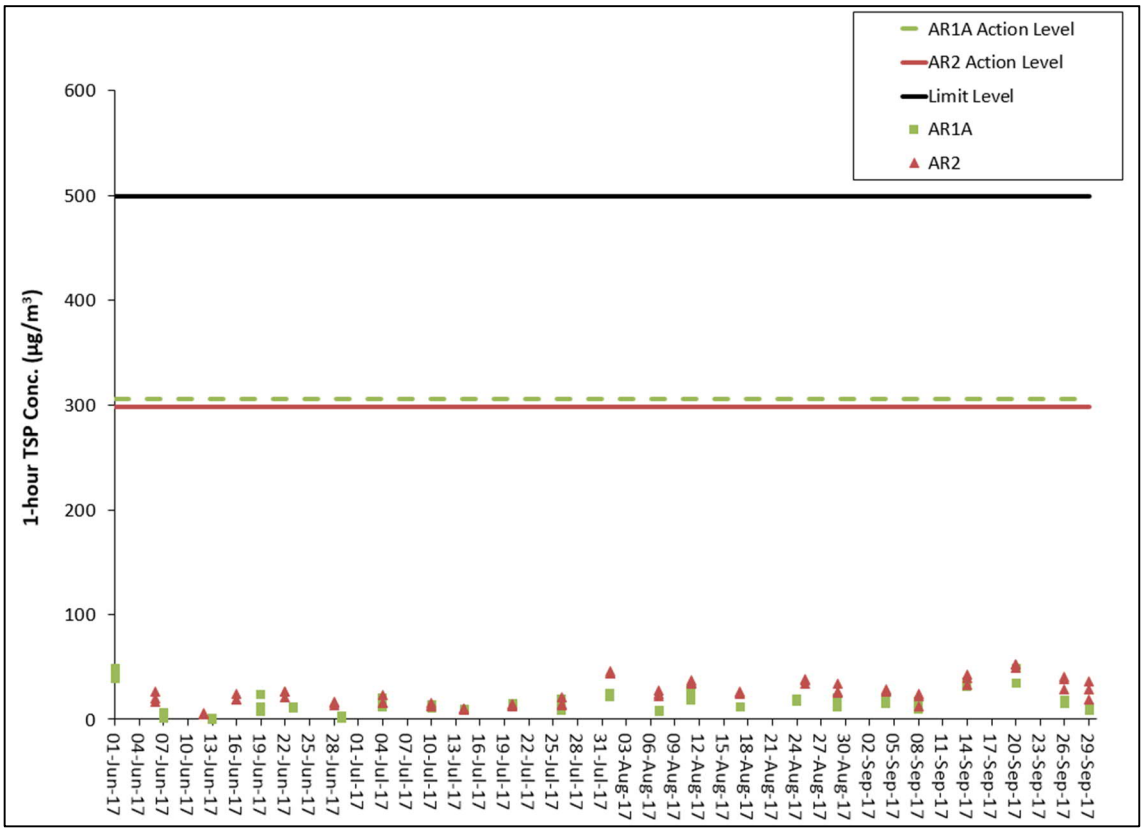
Impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted three times every six days at two representative monitoring stations during the reporting period. The locations of monitoring stations are described in **Table 2.1** and presented in **Figure 2.1**. The Action and Limit Levels of the air quality monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are also provided in **Table 2.1** for reference.

Table 2.1: Impact Air Quality Monitoring Stations

Monitoring Station	Location	Action Level (μg/m³)	Limit Level (μg/m³)
AR1A	Man Tung Road Park	306	500
AR2	Village House at Tin Sum	298	

The graphical plot of impact air quality monitoring results during the reporting period is presented in **Graph 1**.

Graph 1: Graphical Plot of 1-hour TSP concentration at AR1A and AR2 during the Reporting Period



No exceedance of Action or Limit Level was recorded at all monitoring stations in the reporting period.

The weather varied from sunny to rainy during the reporting period. Wind direction was mainly south or southwest in the reporting period.

The key activities of the Project carried out in the reporting period are summarised in **Section 1.5**. The active construction site is around 3 km away from the nearest air sensitive receiver in Tung Chung. The major dust sources during the reporting period were observed to be local air pollution and nearby traffic emissions. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the works of the Project.

2.2 Noise Monitoring

Impact noise monitoring was conducted at five representative monitoring stations once per week during 0700 and 1900 during the reporting period. The locations of monitoring stations are described in **Table 2.2** and presented in **Figure 2.1**. The Action and Limit Levels of the noise monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are provided in **Table 2.2** for reference.

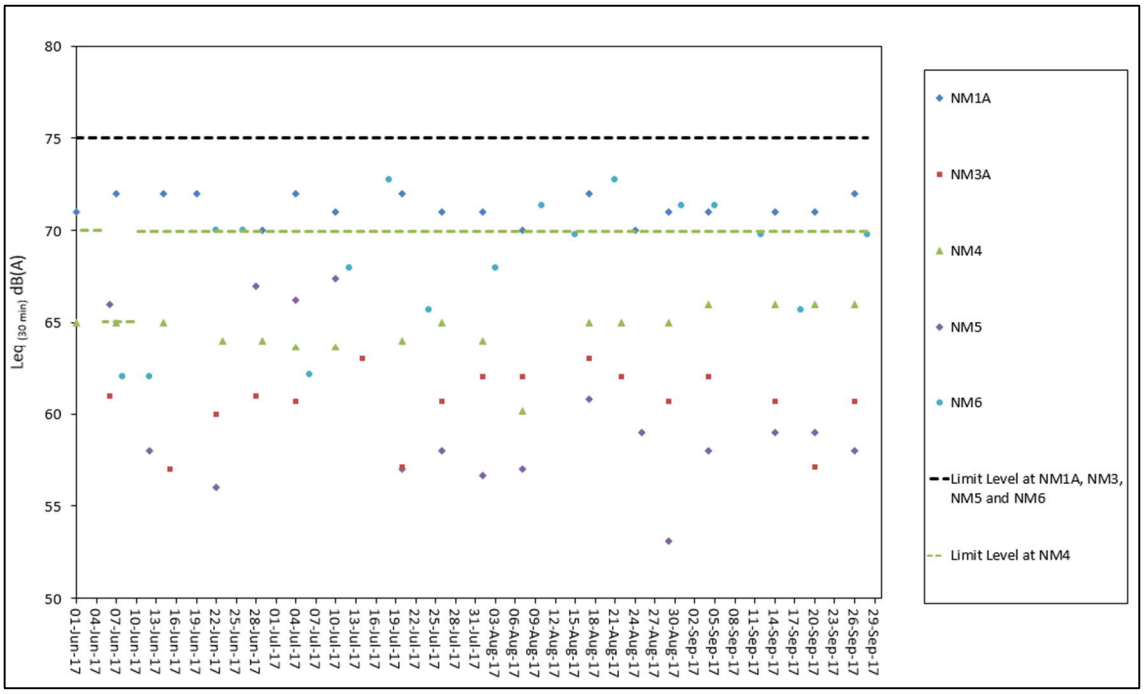
The graphical plot of impact noise quality monitoring results during the reporting period is presented in **Graph 2**.

Table 2.2: Impact Noise Quality Monitoring Stations

Monitoring Station	Location	Action Level	Limit Level
NM1A	Man Tung Road Park	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)
NM3A	Site Office		75 dB(A)
NM4[(i)]	Ching Chung Hau Po Woon Primary School		65dB(A) / 70 dB(A)
NM5	Village House in Tin Sum		75 dB(A)
NM6	House No. 1, Sha Lo Wan		75 dB(A)

Note: [(i)] Reduced to 70dB(A) for school and 65dB(A) during school examination periods.

Graph 2: Graphical Plot of Leq $_{(30min)}$ at NM1A, NM3A, NM4, NM5 and NM6 during the Reporting Period



No exceedance of the Action and Limit Level was recorded at all monitoring stations in the reporting period.

The key activities of the Project carried out in the reporting period are summarised in **Section 1.5**. The active construction work is around 900 m away from the nearest noise sensitive receivers in the villages in North Lantau. The major noise sources during the reporting period were observed to be road traffic and helicopters at NM1A, aircrafts and helicopters at NM3A, helicopters and construction activities from a nearby school at NM4, aircrafts and helicopters at NM5, and aircrafts, helicopters, and marine vessels at NM6. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the works of the Project.

2.3 Water Quality Monitoring

During the reporting period, water quality monitoring was conducted at a total of 22 water quality monitoring stations, comprising 12 impact (IM) stations, 7 sensitive receiver (SR) stations, and 3 control stations in the vicinity of the water quality sensitive receivers around the airport island in accordance with the Manual. The purpose of water quality monitoring at the IM stations is to promptly capture any potential water quality impacts from the Project before the impacts could become apparent at sensitive receivers (represented by the SR stations). **Table 2.3** describes the details of the monitoring stations. **Figure 2.2** shows the locations of the monitoring stations.

Table 2.3: Monitoring Locations and Parameters for Impact Water Quality Monitoring

Monitoring Stations	Description	Coordinates		Parameters
		Easting	Northing	
C1	Control	804247	815620	
C2	Control	806945	825682	

Monitoring Stations	Description	Coordinates		Parameters
C3[3]	Control	817803	822109	
IM1	Impact	806458	818351	DO, pH, Temperature, Salinity, Turbidity, SS, Total Alkalinity, Heavy Metals[2]
IM2	Impact	806193	818852	
IM3	Impact	806019	819411	
IM4	Impact	805039	819570	
IM5	Impact	804924	820564	
IM6	Impact	805828	821060	
IM7	Impact	806835	821349	
IM8	Impact	807838	821695	
IM9	Impact	808811	822094	
IM10	Impact	809838	822240	
IM11	Impact	810545	821501	
IM12	Impact	811519	821162	
SR1[1]	Future Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) Seawater Intake for cooling	812586	820069	DO, pH, Temperature, Salinity, Turbidity, SS
SR2[3]	Planned marine park / hard corals at The Brothers / Tai Mo To	814166	821463	
SR3	Sha Chau and Lung Kwu Chau Marine Park / fishing and spawning grounds in North Lantau	807571	822147	
SR4A	Sha Lo Wan	807810	817189	
SR5A	San Tau Beach SSSI	810696	816593	
SR6	Tai Ho Bay, Near Tai Ho Stream SSSI	814663	817899	
SR7	Ma Wan Fish Culture Zone (FCZ)	823742	823636	
SR8[4]	Seawater Intake for cooling at Hong Kong International Airport (East)	811418 (from July 2017 onwards)	820246	

Notes:

(1) The seawater intakes of SR1 for the future HKBCF are not yet in operation, hence no water quality impact monitoring was conducted at this station. The future permanent location for SR1 during impact monitoring is subject to finalisation after the HKBCF seawater intake is commissioned.

(2) Details of selection criteria for the two heavy metals for regular DCM monitoring refer to the Detailed Plan on Deep Cement Mixing available on the dedicated 3RS website (http://env.threerunwaysystem.com/en/ep-submissions.html). DCM specific water quality monitoring parameters (total alkalinity and heavy metals) were only conducted at C1 to C3, SR2, and IM1 to IM12.

(3) According to the baseline water quality monitoring report, C3 station is not adequately representative as a control station of IM / SR stations during the flood tide. The control reference has been changed from C3 to SR2 from 1 September 2016 onwards.

(4) The monitoring station for SR8 is subject to future changes due to silt curtain arrangements and the progressive relocation of this seawater intake.

2.3.1 Monitoring Schedule

During the reporting period, general water quality monitoring and regular DCM water quality monitoring were conducted three days per week, at mid-flood and mid-ebb tides, at the 23 water quality monitoring stations.

The flood tide monitoring session on 1 July 2017 was cancelled due to marine police blockade of the monitoring area. In addition, the flood tide monitoring session on 22 August 2017 was cancelled due to hoisting Strong Wind Signal No. 3 and adverse sea condition, and the ebb tide monitoring session on 30 September 2017 was cancelled due to hoisting Thunderstorm Signal and adverse sea condition.

2.3.2 Action and Limit Levels for Water Quality Monitoring

The Action and Limit Levels for general water quality monitoring and regular DCM monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are presented in **Table 2.4**. The control and IM stations during flood tide and ebb tide for general water quality monitoring and regular DCM monitoring are presented in **Table 2.5**.

Table 2.4: Action and Limit Levels for General Water Quality Monitoring and Regular DCM Monitoring

Parameters	Action Level (AL)		Limit Level (LL)	
Action and Limit Levels for general water quality monitoring and regular DCM monitoring (excluding SR1& SR8)				
DO in mg/L (Surface, Middle & Bottom)	Surface and Middle 4.5 mg/L		Surface and Middle 4.1 mg/L 5 mg/L for Fish Culture Zone (SR7) only	
	Bottom 3.4 mg/L		Bottom 2.7 mg/L	
Suspended Solids (SS) in mg/L	23	or 120% of upstream control station at the same tide of the same day, whichever is higher	37	or 130% of upstream control station at the same tide of the same day, whichever is higher
Turbidity in NTU	22.6		36.1	
Total Alkalinity in ppm	95		99	
Representative Heavy Metals for early regular DCM monitoring (Chromium)	0.2		0.2	
Representative Heavy Metals for early regular DCM monitoring (Nickel)	3.2		3.6	
Action and Limit Levels SR1				
SS (mg/l)	To be determined prior to its commissioning		To be determined prior to its commissioning	
Action and Limit Levels SR8				
SS (mg/l)	52		60	

Notes:

1. For DO measurement, non-compliance occurs when monitoring result is lower than the limits.
2. For parameters other than DO, non-compliance of water quality results when monitoring results is higher than the limits.
3. Depth-averaged results are used unless specified otherwise.
4. Details of selection criteria for the two heavy metals for early regular DCM monitoring refer to the Detailed Plan on Deep Cement Mixing available on the dedicated 3RS website http://env.threerunwaysystem.com/en/ep-submissions.html)
5. The Action and Limit Levels for the two representative heavy metals chosen will be the same as that for the intensive DCM monitoring.

Table 2.5: The Control and Impact Stations during Flood Tide and Ebb Tide for General Water Quality Monitoring and Regular DCM Monitoring

Control Station	Impact Stations
Flood Tide	
C1	IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, SR3
SR2^1	IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR3, SR4A, SR5A, SR6, SR8
Ebb Tide	
C1	SR4A, SR5A, SR6
C2	IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR2, SR3, SR7, SR8

^1 As per findings of Baseline Water Quality Monitoring Report, the control reference has been changed from C3 to SR2 from 1 Sep 2016 onwards.

2.3.3 Summary of Monitoring Results

The monitoring results for total alkalinity and chromium obtained during the reporting period did not exceed their corresponding Action and Limit Levels stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme if being exceeded. For DO, turbidity, SS, and nickel, some of the testing results exceeded the relevant Action or Limit Levels in the reporting period, and the corresponding investigations were conducted accordingly. The investigation findings concluded that the exceedances were not due to the Project. Summaries of DO, turbidity, SS, and nickel compliance status are presented in **Table 2.6** to **Table 2.15**.

Findings for DO Exceedances

Table 2.6 to **Table 2.9** present a summary of the DO compliance status at IM and SR stations during mid-ebb and mid flood tide for the reporting period.

Table 2.6: Summary of DO (Surface and Middle) Compliance Status (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR2	SR3	SR4A	SR5A	SR6	SR7
06/07/2017																		
05/08/2017																		
22/08/2017																		
No. of Exceedance	2	0	0	0	0	1	2	2	2	1	0	0	0	1	3	0	0	1

Table 2.7: Summary of DO (Bottom) Compliance Status (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR2	SR3	SR4A	SR5A	SR6	SR7
06/07/2017																		
05/08/2017																		
22/08/2017																		
No. of Exceedance	2	1	0	0	0	0	2	1	1	0	0	0	0	1	2	0	0	0

Table 2.8: Summary of DO (Surface and Middle) Compliance Status (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR3	SR4A	SR5A	SR6	SR7
06/07/2017																	
No. of Exceedance	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0

Table 2.9: Summary of DO (Bottom) Compliance Status (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR3	SR4A	SR5A	SR6	SR7
06/07/2017																	
No. of Exceedance	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note 1: The monitoring results on monitoring dates not presented in the above tables did not exceed their corresponding Action or Limit Levels. Detailed results are presented in **Appendix C**.

Note 2: Standby Signal No. 1 was in force when exceedances were recorded at IM1 and SR4A on 22 August 2017.

Legend:	
	No exceedance of Action and Limit Level
	Exceedance of Action Level recorded at monitoring station located downstream of the Project based on dominant tidal flow
	Exceedance of Action Level recorded at monitoring station located upstream of the Project based on dominant tidal flow
	Exceedance of Limit Level recorded at monitoring station located downstream of the Project based on dominant tidal flow
	Exceedance of Limit Level recorded at monitoring station located upstream of the Project based on dominant tidal flow
	Upstream station with respect to the Project during the respective tide based on dominant tidal flow

Investigations were conducted for each of the exceedances and details of the investigation findings are presented in the Construction Phase Monthly EM&A Report no. 19 and 20. All exceedances were found not due to the Project.

It was observed that some of the DO exceedances occurred at stations located upstream of the 3RS Project. Such exceedances at upstream stations would unlikely be affected by the Project, so the investigation focused on exceedance events that occurred at downstream stations.

As part of the investigation on downstream exceedance events, details of the Project's marine construction activities on the concerned monitoring days were collected and presented in the Construction Phase Monthly EM&A Report no. 19 and 20. It was confirmed that both DCM and sand blanket laying activities were operating normally with silt curtains deployed. No construction vessel nor silt plume was observed in the vicinity of the monitoring stations when exceedances were recorded.

Mid-Ebb Tide

Downstream exceedance events occurred at IM1, IM2, SR4A, and SR7. It was noticed that on the concerned monitoring days, no exceedance was recorded at other downstream monitoring stations, such as IM3 and IM12, which were located closer to active marine construction activities. Lower DO concentrations were also recorded during baseline monitoring at some of these monitoring stations. Based on these findings, the exceedances were possibly due to natural fluctuation in the vicinity of these monitoring stations, and considered not due to the Project.

Mid-Flood Tide

Downstream exceedance events occurred at IM8, IM9, and SR3. It was noted that the DO concentration at surface and middle level at C1, the corresponding control station for IM8 and SR3, was also below Action Level during the same tide. Besides, no exceedance was recorded at other monitoring stations, such as IM7 and IM10, which were also located around 500 m from active marine construction activities. Based on these findings, the exceedances were possibly due to natural fluctuation in the vicinity of these monitoring stations, and considered not due to the Project.

Findings for Turbidity Exceedances

Table 2.10 and **Table 2.11** presents a summary of the turbidity compliance status at IM and SR stations during mid-ebb and mid flood tide for the reporting period.

Table 2.10: Summary of Turbidity Compliance Status (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR2	SR3	SR4A	SR5A	SR6	SR7
26/08/2017																		
No. of Exceedance	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0

Table 2.11: Summary of Turbidity Compliance Status (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR3	SR4A	SR5A	SR6	SR7
26/08/2017																	
No. of Exceedance	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0

Note: The monitoring results on monitoring dates not presented in the above table did not exceed their corresponding Action or Limit Levels. Detailed results are presented in **Appendix C**.

Legend:	
	No exceedance of Action and Limit Level
	Exceedance of Action Level recorded at monitoring station located downstream of the Project based on dominant tidal flow
	Exceedance of Action Level recorded at monitoring station located upstream of the Project based on dominant tidal flow
	Upstream station with respect to the Project during the respective tide based on dominant tidal flow

Investigations were conducted for each of the exceedances and details of the investigation findings are presented in the Construction Phase Monthly EM&A Report no. 20. All exceedances were found not due to the Project.

It was observed that some of the turbidity exceedances occurred at stations located upstream of the 3RS Project. Such exceedances at upstream stations would unlikely be affected by the project, so the investigation focused on exceedance events that occurred at downstream stations.

As part of the investigation on downstream exceedance events, details of the Project's marine construction activities on the concerned monitoring days were collected and presented in the Construction Phase Monthly EM&A Report no. 20. It was confirmed that both DCM and sand blanket laying activities were operating normally with silt curtains deployed as additional measures. A construction vessel was observed travelling in the vicinity when monitoring was conducted during mid-flood tide at IM6 on 26 August 2017. No construction works and no leakage of construction material from the vessel was observed.

Mid-Ebb Tide

Downstream exceedance events occurred at IM4 and SR4A. It was noticed that the exceedances appeared to be isolated cases with no temporal trend and no clear spatial trend to indicate turbidity rising due to Project activities. It was also noted that no exceedance was recorded at monitoring station IM3, which is located similarly downstream and close to active construction works on 26 August 2017 during ebb tide, while no exceedances were identified in the repeat turbidity measurements. Based on the above, the exceedances were considered not due to the Project, and were possibly due to natural fluctuation in vicinity of IM4 and SR4A.

Mid-Flood Tide

Downstream exceedance events occurred at IM6 and IM10. It was noticed that the turbidity level at bottom levels of IM6 and IM10 were significantly higher than that at surface and middle levels. Similar observations were also found at nearby upstream and downstream impact stations. The observation above suggests that the exceedances were due to high turbidity level at bottom sea level at a broad area regardless of the location relative to active works. It was also noted that the phenomenon coincided with adverse weather condition (Severe Typhoon Hato and Severe Tropical Storm Pakhar) in the period of 22 to 27 August 2017, which could potentially affect the hydrodynamic and sediment transport conditions at bottom sea levels over a wide region. Based on the above, the exceedances were considered not due to the Project, and were possibly due to natural fluctuation in vicinity of IM6 and IM10.

Findings for SS Exceedances

Table 2.12 and **Table 2.13** present a summary of the SS compliance status at IM and SR stations during mid-ebb and mid-flood tide for the reporting period.

Table 2.12: Summary of SS Compliance Status (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	IM13	SR2	SR3	SR4A	SR5A	SR6	SR7	SR8
13/07/2017																				
24/08/2017																				
26/08/2017																				
09/09/2017																				
No. of Exceedance	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	0

Table 2.13: Summary of SS Compliance Status (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	IM13	SR3	SR4A	SR5A	SR6	SR7	SR8
24/08/2017																			
26/08/2017																			
09/09/2017																			
No. of Exceedance	0	0	1	0	0	0	0	0	1	2	3	2	0	0	0	0	0	0	0

Note: The monitoring results on monitoring dates not presented in the above table did not exceed their corresponding Action or Limit Levels. Detailed results are presented in **Appendix C**.

Legend:	
	No exceedance of Action and Limit Level
	Exceedance of Action Level recorded at monitoring station located downstream of the Project based on dominant tidal flow
	Exceedance of Action Level recorded at monitoring station located upstream of the Project based on dominant tidal flow

	Exceedance of Limit Level recorded at monitoring station located downstream of the Project based on dominant tidal flow
	Exceedance of Limit Level recorded at monitoring station located upstream of the Project based on dominant tidal flow
	Upstream station with respect to the Project during the respective tide based on dominant tidal flow

Investigations were conducted for each of the exceedances and details of the investigation findings are presented in the Construction Phase Monthly EM&A Report no. 19, 20, and 21. All exceedances were found not due to the Project.

It was observed that some of the SS exceedances occurred at stations located upstream of the 3RS Project. Such exceedances at upstream stations would unlikely be affected by the project, so the investigation focused on exceedance events that occurred at downstream stations.

As part of the investigation on downstream exceedance events, details of the Project's marine construction activities on the concerned monitoring days were collected and presented in the Construction Phase Monthly EM&A Report no. 20 and 21. It was confirmed that both DCM and sand blanket laying activities were operating normally with silt curtains deployed as additional measures. No construction vessel nor silt plume was observed in the vicinity of the monitoring stations when exceedances were recorded.

Mid-Ebb Tide

Downstream exceedance events occurred at IM11, SR4A, and SR6. For the exceedance events at SR4A and SR6, no exceedance was recorded at all impact stations, which were closer to the active works, during the same tide on the same day. For the exceedance event at IM11, there was no observable temporal and spatial trend to indicate any effect due to Project. As there is no evidence of SS release due to Project activities from site observations and all mitigation measures were carried out properly, the exceedances were considered not due to the Project, and were possibly due to natural fluctuation in vicinity of IM11, SR4A, and SR6.

Mid-Flood Tide

Downstream exceedance events occurred at IM9 and IM10. It was found that similar or higher SS levels were apparent at IM11 and IM12 during the same tide on the same day. The investigation also found that the SS levels at bottom sea level were significantly higher and the phenomenon occurred at a broad area regardless of the location relative to active works. The phenomenon also coincided with adverse weather conditions (Severe Typhoon Hato and Severe Tropical Storm Pakhar), which could potentially affect the hydrodynamic and sediment transport conditions at bottom sea levels over a wide region. Based on the above, the exceedances were considered not due to the Project.

Findings for Nickel Exceedances

Table 2.14 and **Table 2.15** presents a summary of the nickel compliance status at IM stations during mid-ebb and mid-flood tide for the reporting period.

Table 2.14: Summary of Nickel Compliance Status (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12
06/07/2017												
18/07/2017												
29/08/2017												
31/08/2017												
No. of Exceedance	0	1	1	0	0	0	0	0	3	1	0	1

Table 2.15: Summary of Nickel Compliance Status (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12
06/07/2017												
18/07/2017												
20/07/2017												
22/07/2017												
17/08/2017												
19/08/2017												
31/08/2017												
02/09/2017												
05/09/2017												
09/09/2017												
12/09/2017												
14/09/2017												
No. of Exceedance	0	0	0	0	0	1	1	8	6	4	3	0

Note: The monitoring results on monitoring dates not presented in the above table did not exceed their corresponding Action or Limit Levels. Detailed results are presented in **Appendix C**.

Legend:	
	No exceedance of Action and Limit Level
	Exceedance of Action Level recorded at monitoring station located downstream of the Project based on dominant tidal flow
	Exceedance of Action Level recorded at monitoring station located upstream of the Project based on dominant tidal flow
	Exceedance of Limit Level recorded at monitoring station located downstream of the Project based on dominant tidal flow
	Exceedance of Limit Level recorded at monitoring station located upstream of the Project based on dominant tidal flow
	Upstream station with respect to the Project during the respective tide based on dominant tidal flow

Investigations were conducted for each of the exceedances and details of the investigation findings are presented in the Construction Phase Monthly EM&A Report no. 19, 20, and 21. All exceedances were found not due to the Project.

It was observed that some of the nickel exceedances occurred at stations located upstream of the 3RS Project. Such exceedances at upstream stations would unlikely be affected by the project, so the investigation focused on exceedance events that occurred at downstream stations.

As part of the investigation on downstream exceedance events, details of the Project's marine construction activities on the concerned monitoring days were collected and presented in the Construction Phase Monthly EM&A Report no. 19, 20 and 21. It was confirmed that both DCM and sand blanket laying activities were operating normally with silt curtains deployed as additional measures. No construction vessel nor silt plume was observed in the vicinity of the monitoring stations when exceedances were recorded.

Mid-Ebb Tide

Downstream exceedance events occurred at IM2, IM3, and IM12. Nickel is a representative heavy metal that indicates the potential for release of contaminants from contaminated mud pits due to the disturbance of marine sediment within the contaminated mud pits by DCM activities.

Therefore, elevated nickel concentration due to these activities should be associated with similar elevated SS levels. For these exceedance events, the SS level at these stations were well below the Action and Limit Level, which indicates that the active DCM works had limited or insignificant effect on downstream water quality. Based on the above, the exceedances were considered not due to the Project, and were possibly due to natural fluctuation in vicinity of IM2, IM3, and IM12.

Mid-Flood Tide

Downstream exceedance events occurred at IM6, IM7, IM8, IM9, and IM10. For all exceedance events, the SS level recorded in the same station during the same tide on the same day were well below their corresponding Action or Limit Level. Based on the explanation presented earlier (for mid-ebb tide exceedances), a lack of elevated SS indicates that the active DCM works had limited or insignificant effect on downstream water quality. Therefore, the exceedances were considered not due to the Project, and were possibly due to natural fluctuation in vicinity of IM6, IM7, IM8, IM9, and IM10 respectively.

Conclusions

Based on the findings of the exceedance investigations presented in Construction Phase Monthly EM&A Report no. 19, 20, and 21, it was concluded that the exceedances during this reporting period were not due to the Project; hence, no SR stations were adversely affected by the Project. All required actions under the Event and Action Plan had been followed. Exceedances appeared due to natural fluctuation or other sources not related to the Project.

Nevertheless, recognising that the IM stations represent a 'first line of defence', the non-project related exceedances identified at IM stations have been attended to as triggers of precautionary measures. As part of the EM&A programme, the construction methods and mitigation measures for water quality will continue to monitor and opportunities for further enhancement will continue to explore and implement where possible, to strive for better protection of water quality and the marine environment.

In the meantime, the contractors were reminded to implement and maintain all mitigation measures during weekly site inspection. These include maintaining the silt curtain for sand blanket laying properly and maintaining the levels of materials on barges to avoid overflow as recommended in the Manual.

2.4 Waste Monitoring

In accordance with the Manual, the waste generated from construction activities was audited once per week to determine if wastes were being managed in accordance with the Waste Management Plan (WMP) prepared for the Project, contract-specific WMP, and any statutory and contractual requirements. All aspects of waste management including waste generation, storage, transportation, and disposal were assessed during the audits. The Action and Limit Levels of the construction waste are provided in **Table 2.16**.

Table 2.16: Action and Limit Levels for Construction Waste

Monitoring Stations	Action Level	Limit Level
Construction Area	When one valid documented complaint is received	Non-compliance of the WMP, contract-specific WMPs, any statutory and contractual requirements

Weekly waste monitoring of the Project construction works was carried out by the ET to check and monitor the implementation of proper waste management practices during the construction phase during the reporting period.

Recommendations were provided during monitoring, including provision and maintenance of spill kits and drip trays, provision of proper storage area for general refuse and chemical waste, as well as regular segregation and removal of waste. The contractors had taken actions to implement the recommended measures.

Based on the contractor's information, about 1,856 m^3 of excavated materials were produced from the HDD and excavation works in the reporting period. The excavated materials were temporarily stored at the stockpiling area and will be reused in the Project.

In addition, metal and paper were recycled during the reporting period. In the reporting period, around 416 tonnes of general refuse were disposed of to the West New Territories (WENT) Landfill, 395 kg and 9,000 litres of chemical waste were collected by licensed chemical waste collector, around 88 m^3 of Construction and Demolition (C&D) material generated from the reclamation contract and Terminal 2 expansion works contract was disposed of as public fill, and around 575 m^3 of C&D material was reused in other contracts.

No exceedance of the Action or Limit Levels was recorded in the reporting period.

2.5 CWD Monitoring

2.5.1 Summary of Monitoring Requirements

CWD monitoring was conducted by vessel line-transect survey at a frequency of two full surveys per month, supplemented by land-based theodolite tracking and PAM. The frequency of the theodolite tracking during the construction phase was one day per month at both Sha Chau (SC) and Lung Kwu Chau (LKC) stations as stipulated in the Manual. Additional theodolite tracking at the SC station and the LKC station (in total 2 tracking days and 3 tracking days per month at respective stations) were also conducted on a voluntary basis to collect supplementary information for the project. Monitoring was fully completed in the reporting period. The vessel survey transect lines matched those proposed in the Manual and transect lines are consistent with those used in the Agriculture, Fisheries and Conservation Department (AFCD) long-term CWD monitoring programme. The locations of CWD monitoring by vessel survey transect conducted from July to September 2017 are shown in **Figure 2.3**, whilst the land-based survey stations are described in **Table 2.17** and depicted in **Figure 2.4**. The location of the PAM device is shown in **Figure 2.10**.

Table 2.17: Land-based Survey Station Details

Stations	Location	Geographical Coordinates	Station Height (m)	Approximate Tracking Distance (km)
D	Sha Chau (SC)	22° 20' 43.5" N 113° 53' 24.66" E	45.66	2
E	Lung Kwu Chau (LKC)	22° 22' 44.83" N 113° 53' 0.2" E	70.40	3

The Action Level (AL) and Limit Level (LL) for CWD monitoring were formulated by an action response approach using the running quarterly dolphin encounter rates (STG and ANI) derived from baseline monitoring data, as presented in the CWD Baseline Monitoring Report. The derived values of AL and LL for CWD monitoring are shown in **Table 2.18**.

Table 2.18: Derived Values of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring

	NEL, NWL, AW, WL and SWL as a Whole
Action Level	Running quarterly STG < 1.86 & ANI < 9.35
Limit Level	Two consecutive running quarterly (3-month) STG < 1.86 & ANI < 9.35

2.5.2 Summary of Monitoring Results

Vessel Line-transect Survey

Survey Effort

During the reporting period, six complete sets of vessel line-transect surveys were conducted from July to September 2017 to cover all transects in Northeast Lantau (NEL), Northwest Lantau (NWL), Airport West (AW), West Lantau (WL) and Southwest Lantau (SWL) survey areas twice per month.

A total of around 1,340 km of survey effort was collected from these surveys, with around 84.9% of the total survey effort being conducted under favourable weather condition (i.e. Beaufort Sea State 3 or below with favourable visibility). Details of the survey effort data are presented in **Appendix D**.

CWD Sighting

From July to September 2017, there were in total 93 groups of CWDs with 266 individuals sighted (**Table 2.19**). Amongst the sightings of CWDs, 76 groups with 227 individuals were made during on-effort searches during favourable weather conditions.

When breaking down the sightings by survey areas, 16 sightings with 40 individuals, one sighting with a single individual, 42 sightings with 116 individuals and 34 sightings with 109 individuals were recorded in NWL, AW, WL and SWL survey areas respectively during the current reporting period. No CWD was sighted in NEL survey area.

Compared to last quarter (i.e. April to June 2017), there are observable increases in CWD records in NWL and SWL. Although there is an increase in number of CWD sightings in WL by 40%, the number of CWD individuals recorded in WL declined by around 24.2%. Overall, there is an observable increase in CWD records in the current reporting quarter (i.e. from July to September 2017) from the last quarter.

Comparison between the current reporting quarter and the same quarter of last year (i.e. July to September 2016) revealed that the overall CWD records in terms of number of CWD individuals is similar although there is an increase in overall number of sightings.

Table 2.19 below shows the comparison of the numbers of sightings and individuals between the current reporting period, last quarter and the same quarter of year 2016.

Table 2.19: Summary of Number of CWD Sightings and Number of CWD Individuals for Previous Quarters and Current Reporting Period

	July to September 2016	April to June 2017	July to September 2017
NEL	0 (0)	0 (0)	0 (0)
NWL	12 (55)	5 (10)	16 (40)
AW	1 (2)	0 (0)	1 (1)
WL	32 (118)	30 (153)	42 (116)
SWL	21 (101)	23 (63)	34 (109)

	July to September 2016	April to June 2017	July to September 2017
Total	66 (276)	58 (226)	93 (266)

Note: Values in ( ) represent number of CWD individuals

Distribution of CWD sightings recorded from July to September 2017 are illustrated in **Figure 2.5**. In NWL, CWD sightings were mostly recorded in the northwestern part of the survey area, particularly around the western side of Lung Kwu Chau as well as the waters between Lung Kwu Chau and Lung Kwu Tan. Two sightings were recorded in the southwestern part of NWL, one was in close vicinity to the 3RS temporary works area, while another was close to Hong Kong-Zhuhai-Macau Bridge Hong Kong Link Road. In WL, the majority of the CWD sightings were located along the coastal waters from Tai O to Fan Lau, especially the waters around Tai O, Yi O, Peaked Hill (Kai Yet Kok) and Fan Lau. While in SWL, CWD sightings mainly distributed on the transects in the western and central part of the survey area on both coastal and off-shore waters, particularly around the waters from Fan Lau to Fan Lau Tung Wan and the waters west to Soko Islands. Details of the sighting data are presented in **Appendix D**.

Figure 2.5: Sightings Distribution of Chinese White Dolphins

[Pink circle: Sighting locations of CWD, Black line: Vessel survey transects, Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP); Green polygon: Brothers Marine Park (BMP); Red polygon: 3RS land-formation footprint; Yellow line: 3RS temporary works area boundary]

Remarks: Please note that there are 93 pink circles on the map indicating the sighting locations of CWD. Some of them were very close to each other and therefore appear overlapped on this sighting distribution map.

Encounter Rate

The dolphin encounter rates for the number of dolphin sightings per 100 km survey effort (STG) and for the total number of dolphins per 100 km survey effort (ANI) in the whole survey area (i.e. NEL, NWL, AW, WL and SWL) for July, August and September 2017 are summarized in Table 2.20.

In this reporting period, the monthly encounter rates for STG and ANI both increase from July to August 2017 followed by a drop in September 2017. Comparing with the previous reporting period, both the running quarterly STG and ANI increase from 4.45 to 6.68 and from 17.65 to 19.97 respectively.

Table 2.20: Summary of Monthly and Running Quarterly STG and ANI of Chinese White Dolphin for Previous and Current Reporting Periods

	Previous Reporting Period			Current Reporting Period		
	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17
Monthly STG	2.96	4.21	6.30	6.76	8.11	5.32
Monthly ANI	8.88	25.49	18.64	18.45	24.06	17.73
Running Quarterly STG	3.49	3.06	4.45	5.73	7.03	6.68
Running Quarterly ANI	12.33	14.46	17.65	20.95	20.30	19.97

Notes: For detailed calculations of encounter rates STG and ANI, please refer to the Monthly EM&A Reports No. 19, No. 20 and No. 21.

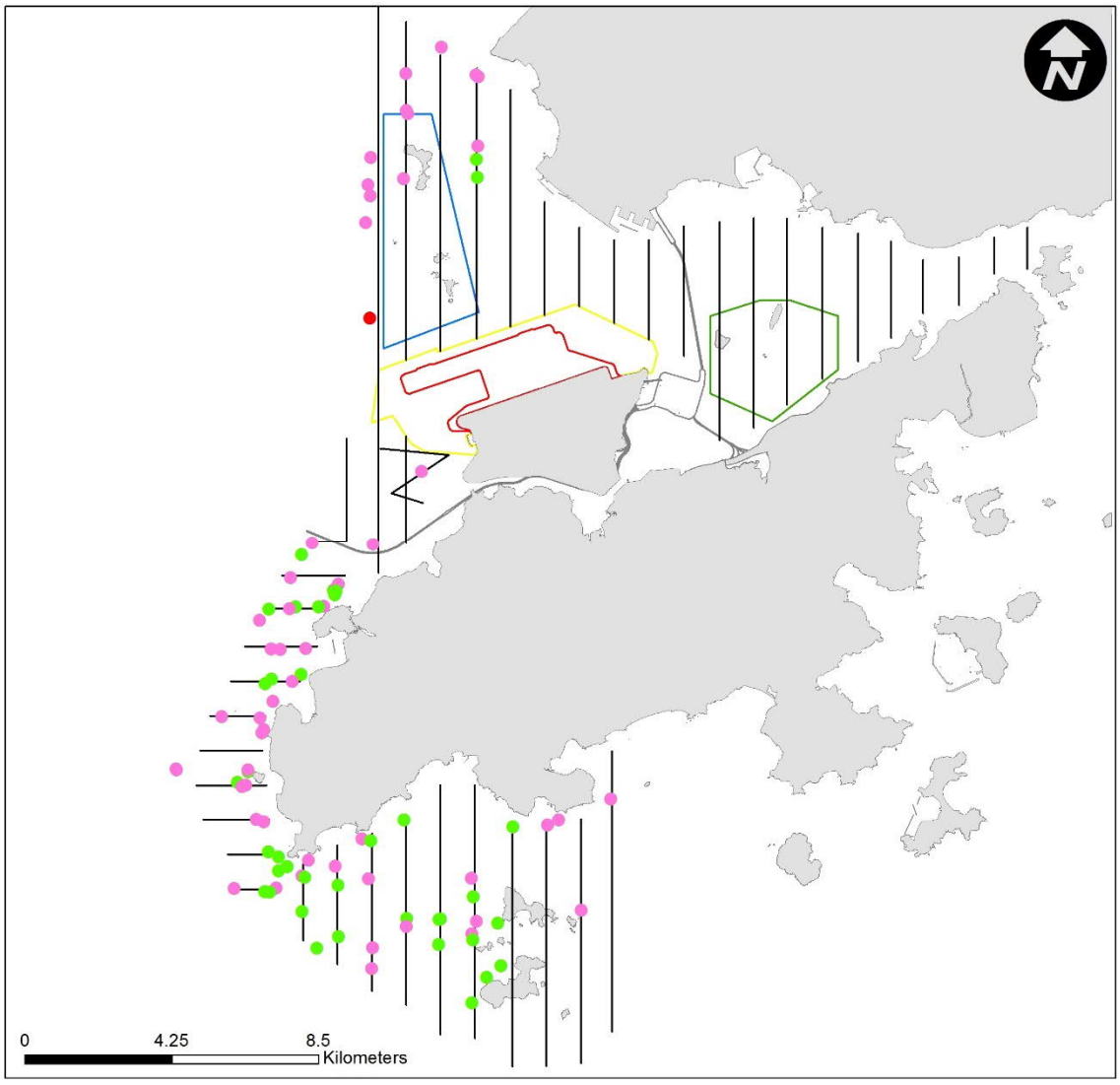
Group Size

Between July and September 2017, the group size of CWDs ranged from 1 to 15 individuals per group. The average group size of CWDs was 2.9 individuals per group while that of the last quarter was 3.9. Over half of the CWD sightings (i.e. 54 groups) were of small group size (i.e. 1-2 individuals). There was only one CWD sighting with a large group size (i.e. 10 or more individuals) in this reporting period, recorded in NWL.

In NWL and WL, small CWD group size sightings dominated in this reporting period. While in SWL, the number of medium CWD group size sightings (i.e. 3-9 individuals) is slightly higher than sightings with small group size. Sighting locations of CWD groups with different group sizes are depicted in **Figure 2.6**.

Figure 2.6: Sighting Locations of Chinese White Dolphins with Different Group Sizes

[Pink circle: Sighting locations of CWD with group size from 1 to 2 individuals; Green circle: Sighting locations of CWD with group size from 3 to 9 individuals; Red circle: Sighting locations of CWD with group size of 10 or above; Black line: Vessel survey transects; Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP); Green polygon: Brothers Marine Park (BMP); Red polygon: 3RS land-formation footprint; Yellow line: 3RS temporary works area boundary

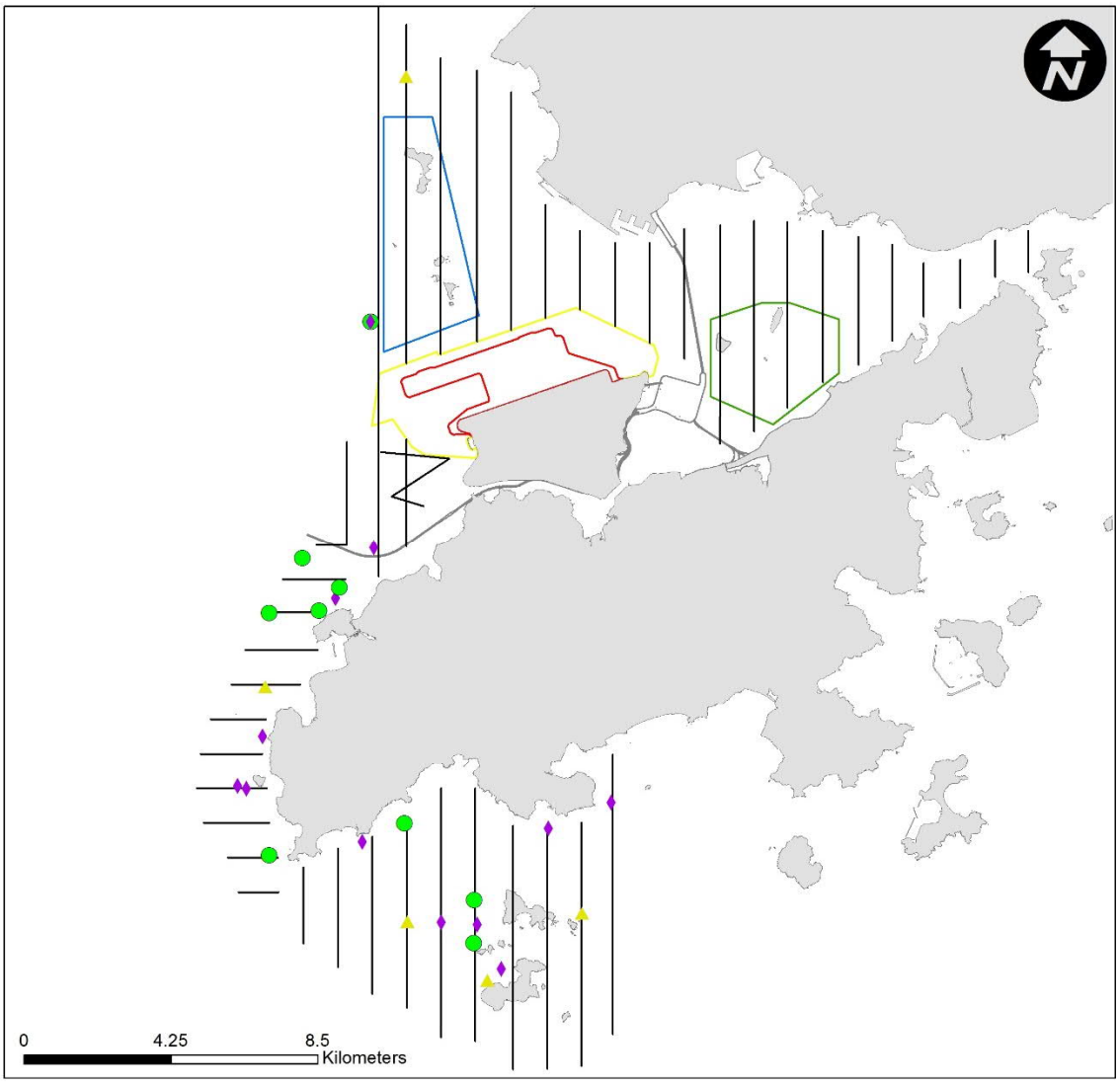


Activities and Association with Fishing Boats

During July to September 2017, 12 groups of CWDs were sighted with feeding activities. Amongst these 12 groups of feeding CWDs, two groups were observed in association with operating fishing boat (gill netter) in SWL. The sighting locations of CWDs engaged in different behaviours during the reporting period are illustrated in Figure 2.7.

Figure 2.7: Sighting Locations of Chinese White Dolphins Engaged in Different Behaviours

[Indigo rhombus: Foraging; Green circle: Socializing; Yellow triangle: Travelling; Black line: Vessel survey transects; Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP); Green polygon: Brothers Marine Park (BMP); Red polygon: 3RS land-formation footprint; Yellow line: 3RS temporary works area boundary]

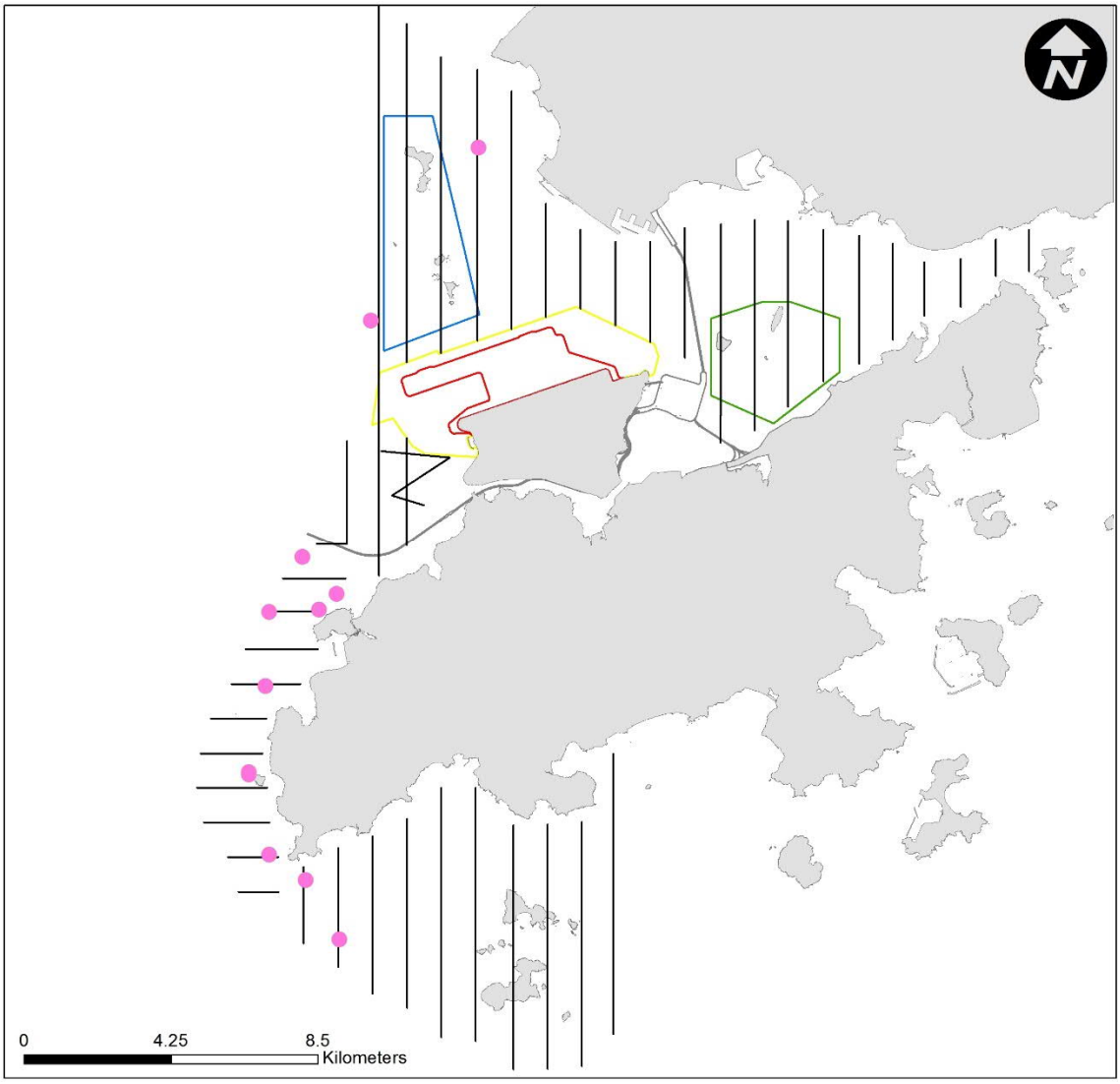


Mother-calf Pairs

From July to September 2017, 12 sightings of CWDs were recorded with the presence of mother-and-calf, mother-and-unspotted juvenile and/or mother-and-spotted juvenile pairs. Two-thirds of these mother-calf pairs were sighted in WL. The sighting locations of mother-calf pairs are shown in **Figure 2.8**.

Figure 2.8: Sighting Locations of Mother-calf Pairs

[Pink circle: Sighting locations of mother-calf pairs; Black line: Vessel survey transects; Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP); Green polygon: Brothers Marine Park (BMP); Red polygon: 3RS land-formation footprint; Yellow line: 3RS temporary works area boundary]



Remarks: Please note that there are 12 pink circles on the map indicating the locations of the sightings with the presences of mother-and-calf, mother-and-unspotted juvenile and/or mother-and-spotted juvenile pairs. Some of them were very close to each other and therefore appear overlapped on this sighting distribution map.

Photo Identification

During July to September 2017, a total number of 76 different CWD individuals were identified altogether 118 times. Re-sighting information of CWD individuals provides an initial idea of their range use and apparent connection between different areas around Lantau. Amongst these 76 different CWD individuals, 31 animals (i.e. NLMM019, NLMM020, NLMM023, NLMM033, NLMM034, NLMM051, NLMM052, SLMM012, SLMM015, SLMM017, SLMM023, SLMM034, SLMM040, SLMM045, SLMM050, SLMM054, WLMM001, WLMM003, WLMM006, WLMM008, WLMM009, WLMM011, WLMM015, WLMM020, WLMM027, WLMM028, WLMM043, WLMM046, WLMM079, WLMM100 and WLMM101) were sighted for more than once.

Thirteen individuals including NLMM019, NLMM020, NLMM023, NLMM052, SLMM023, WLMM001, WLMM003, WLMM006, WLMM009, WLMM011, WLMM027, WLMM046 and WLMM079 were re-sighted in different survey areas within this reporting period. Amongst these 13 animals, NLMM019, NLMM020, NLMM023, NLMM052 and WLMM027 have cross-area movement between NWL (including AW) and WL or SWL survey area. Whilst SLM023, WLMM001, WLMM003, WLMM006, WLMM009, WLMM011, WLMM046 and WLMM079 have cross-area movement in WL and SWL. Two animals, NLMM020 and NLMM023, have been identified in every month in this reporting period and they are the only animals showing cross-area movement between NWL, WL and SWL during this reporting period. The number of CWD individuals re-sighted for more than once and the number of CWD individuals showing cross-area movement are both higher than last quarter (i.e. April to June 2017).

A summary of photo identification works is presented in **Table 2.21**. Representative photos of the 76 identified individuals and figures depicting the sighting locations of the aforementioned 31 re-sighted individuals recorded in this reporting period are presented **Appendix D**.

Table 2.21: Summary of Photo Identification

Individual ID	Date of sighting	Sighting Group No.	Area
NLMM005	18/09/2017	2	NWL
NLMM013	14/07/2017	1	NWL
NLMM019	12/07/2017	1	NWL
	12/09/2017	4	WL
		5	WL
	18/09/2017	1	NWL
NLMM020	12/07/2017	1	NWL
	21/08/2017	4	SWL
	12/09/2017	4	WL
		5	WL
	18/09/2017	1	NWL
NLMM022	18/09/2017	1	NWL
NLMM023	11/07/2017	13	SWL
	12/09/2017	5	WL
	18/09/2017	1	NWL
NLMM027	22/08/2017	7	WL
NLMM028	22/08/2017	7	WL
NLMM033	22/08/2017	3	WL
		6	WL
NLMM034	11/07/2017	2	WL
		5	WL
NLMM037	18/09/2017	3	NWL
NLMM040	22/08/2017	6	WL
NLMM041	22/08/2017	6	WL
NLMM042	18/09/2017	1	NWL
NLMM050	14/07/2017	2	NWL
NLMM051	22/08/2017	3	WL
		6	WL
	19/09/2017	1	WL
NLMM052	18/09/2017	1	NWL
	20/09/2017	1	SWL
NLMM053	18/09/2017	1	NWL
SLMM003	26/07/2017	4	SWL
SLMM010	20/07/2017	1	SWL
SLMM059	26/07/2017	5	SWL
SLMM060	15/08/2017	2	SWL
SLMM061	15/08/2017	3	SWL
SLMM062	15/08/2017	5	SWL
SLMM063	15/08/2017	7	SWL
SLMM064	21/08/2017	5	SWL
WLMM001	11/07/2017	10	WL
		13	SWL
WLMM003	11/07/2017	13	SWL
	22/08/2017	7	WL
WLMM006	11/07/2017	12	SWL
	20/07/2017	3	WL
WLMM008	26/07/2017	3	SWL
	22/08/2017	11	SWL
WLMM009	11/07/2017	12	SWL
	20/07/2017	3	WL
WLMM011	22/08/2017	8	WL
		10	SWL
	20/09/2017	3	SWL
WLMM013	21/07/2017	2	WL
WLMM015	11/07/2017	9	WL
	21/07/2017	2	WL
WLMM019	19/09/2017	2	WL
WLMM020	15/08/2017	5	SWL
		7	SWL
WLMM027	21/08/2017	2	SWL
	22/08/2017	1	AW
	20/09/2017	3	SWL
WLMM028	11/07/2017	10	WL
	19/09/2017	6	WL
WLMM029	19/09/2017	6	WL
WLMM032	19/09/2017	6	WL
WLMM038	11/07/2017	5	WL
WLMM043	21/07/2017	5	WL

Individual ID	Date of sighting	Sighting Group No.	Area
SLMM011	20/07/2017	1	SWL
SLMM012	20/09/2017	1	SWL
		2	SWL
SLMM014	22/08/2017	9	WL
SLMM015	21/08/2017	1	SWL
	11/09/2017	2	SWL
SLMM017	11/09/2017	2	SWL
	20/09/2017	1	SWL
		2	SWL
SLMM023	21/08/2017	1	SWL
	22/08/2017	9	WL
SLMM030	21/07/2017	7	WL
SLMM034	15/08/2017	3	SWL
	21/08/2017	1	SWL
SLMM036	20/09/2017	3	SWL
SLMM037	20/09/2017	1	SWL
SLMM040	11/07/2017	7	WL
	21/07/2017	5	WL
SLMM045	21/07/2017	7	WL
	22/08/2017	2	WL
SLMM050	20/09/2017	1	SWL
		2	SWL
SLMM054	15/08/2017	1	SWL
	19/09/2017	8	SWL
SLMM057	15/08/2017	5	SWL

Individual ID	Date of sighting	Sighting Group No.	Area
		7	WL
WLMM046	21/08/2017	3	SWL
	19/09/2017	1	WL
WLMM047	21/07/2017	7	WL
WLMM049	20/09/2017	1	SWL
WLMM051	14/08/2017	3	WL
WLMM053	18/09/2017	1	NWL
WLMM056	20/09/2017	1	SWL
WLMM067	11/07/2017	12	SWL
WLMM076	26/07/2017	5	SWL
WLMM078	26/07/2017	5	SWL
WLMM079	11/07/2017	7	WL
	26/07/2017	4	SWL
	12/09/2017	3	WL
WLMM089	22/08/2017	7	WL
WLMM096	19/09/2017	1	WL
WLMM097	11/07/2017	1	WL
WLMM098	11/07/2017	1	WL
WLMM099	11/07/2017	3	WL
WLMM100	11/07/2017	10	WL
	12/09/2017	3	WL
WLMM101	22/08/2017	4	WL
	19/09/2017	1	WL
WLMM102	19/09/2017	1	WL
WLMM103	19/09/2017	2	WL

Land-based Theodolite Tracking

Survey Effort

During July to September 2017, a total of 15 days of land-based theodolite tracking survey effort were completed, including nine days on Lung Kwu Chau and six days on Sha Chau. In total, 43 CWD groups were tracked from the Lung Kwu Chau station while two CWD groups were tracked from the Sha Chau station, with an overall 0.50 CWD groups sighted per survey effort hour.

Information on survey effort and CWD groups sighted during land-based theodolite tracking surveys are presented in **Table 2.22**. Details on the survey effort and CWD groups tracked are presented in **Appendix D**. The first sighting locations of CWD groups tracked between July and September 2017 are shown in **Figure 2.9**.

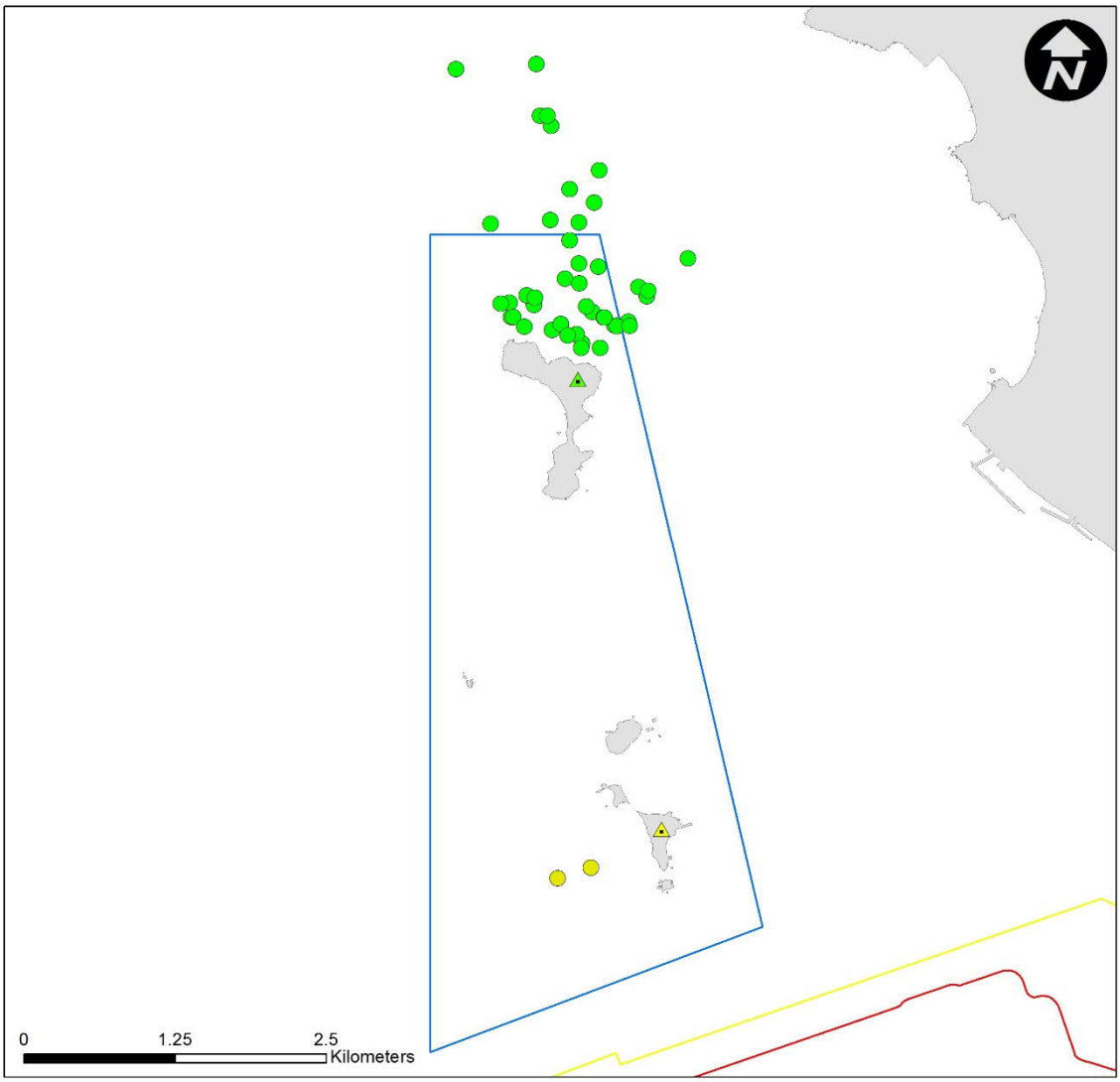
Table 2.22: Summary of Survey Effort and CWD Group of Land-based Theodolite Tracking

Land-based Station	# of Survey Sessions	Survey Effort (hh:mm)	# CWD Groups Sighted	CWD Group Sighting per Survey Hour
July 2017				
Lung Kwu Chau	3	18:10	9	0.50
Sha Chau	2	12:00	0	0
TOTAL	**5**	**30:10**	**9**	**0.30**
August 2017				
Lung Kwu Chau	3	18:00	11	0.61
Sha Chau	2	12:00	2	0.17
TOTAL	**5**	**30:00**	**13**	**0.43**

Land-based Station	# of Survey Sessions	Survey Effort (hh:mm)	# CWD Groups Sighted	CWD Group Sighting per Survey Hour
September 2017				
Lung Kwu Chau	3	18:00	23	1.28
Sha Chau	2	12:00	0	0
TOTAL	**5**	**30:00**	**23**	**0.77**
OVERALL	**15**	**90:10**	**45**	**0.50**

Figure 2.9: Plots of First Sightings of All CWD Groups from Land-based Stations

[Green triangle: LKC station; Yellow triangle: SC station; Green circle: CWD group off LKC; Yellow circle: CWD group off SC; Blue line: SCLKCMP boundary; Yellow line: 3RS temporary works area; Red line: 3RS land-formation footprint]



Progress Update on PAM

An Ecological Acoustic Recorder (EAR) has been deployed and positioned to the south of Sha Chau Island with 20% duty cycle with data from the EAR intended primarily to supplement the data collected from the land-based theodolite station on Sha Chau. The EAR has been shifted to a position south of Sha Chau Island inside the SCLKCMP since 2 August 2017 due to marine safety (**Figure 2.10**). The EAR deployment generally lasts around 4-6 weeks followed by a period of data retrieval for subsequent analysis. As the data analysis takes more than two months after retrieval, PAM results are not suitable for reporting on a quarterly basis. Rather, detailed analysis of PAM data will be presented in annual CWD reports.

Site Audit for CWD-related Mitigation Measures

During the reporting period, silt curtains were in place by the contractors for sand blanket laying works, in which dolphin observers were deployed by each contractor in accordance with the Marine Mammal Watching Plan (MMWP). Teams of at least two dolphin observers were deployed at 12 to 16 dolphin observation stations by the contractors for continuous monitoring of the DEZ for DCM works and seawall construction in accordance with the DEZ Plan. Trainings for the proposed dolphin observers on the implementation of MMWP and DEZ monitoring were provided by the ET prior to the aforementioned works, with a cumulative total of 470 individuals being trained and the training records kept by the ET. Observations were recorded on DEZ monitoring in this reporting period during site inspection by the ET and IEC. The contractors had taken actions to implement the recommended measures. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine mammals were observed within or around the silt curtains, whilst there were four records of dolphin sighting within the DEZ of DCM works in this reporting period. According to the contractors' site records, relevant DCM works were suspended in the dolphin sighting events until the DEZ was clear of dolphin for a continuous period of 30 minutes. The contractors' records were also audited by the ET during site inspection.

Audits of acoustic decoupling for construction vessels were carried out during weekly site inspection and summarised in **Section 2.6**. Summary of audits of SkyPier High Speed Ferries route diversion and speed control and construction vessel management are presented in **Section 2.8** and **Section 2.9** respectively.

2.6 Weekly Environmental Site Inspection

Site inspections of the construction works were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. Bi-weekly site inspections were also conducted by the IEC. Observations have been recorded in the site inspection checklist and passed to the contractor together with the appropriate recommended mitigation measures where necessary.

The key observations from site inspection and associated recommendations were related to:

- display of relevant permit, licenses, and labels;
- provision and maintenance of drip trays and chemical storage area;
- implementation of noise mitigation, dust suppression, and surface runoff prevention measures; and
- segregation of waste for recycling and disposal.

In addition, recommendations were provided during site inspection on construction vessels, which include:

- provision and maintenance of drip tray, general refuse storage area, and chemical storage area;
- proper implementation of acoustic decoupling, wastewater treatment, DEZ monitoring, dust suppression, spill and runoff preventive measures, and dark smoke preventive measures;
- proper disposal of general refuse and segregation of recyclables from general refuse; and
- ensuring the effectiveness of silt curtains.

The daily visual inspection checklists for silt curtains and bi-weekly diver inspection records which were implemented by the contractors in accordance with the Silt Curtain Deployment Plan had been checked during site inspection and reviewed at the end of the reporting period, summarizing that the silt curtains were maintained in the correct positions and intact without obvious defects or damage.

A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix B**.

2.7 Ecological Monitoring

In accordance with the Manual, ecological monitoring shall be undertaken monthly at the HDD daylighting location on Sheung Sha Chau Island during the HDD construction works period from August to March to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found.

No construction works was carried out at Sheung Sha Chau in July 2017 (i.e. during the ardeid's breeding season). Monthly ecological monitoring was carried out in August and September 2017 on Sheung Sha Chau Island. No encroachment of any works upon the egretry area nor any significant disturbance to the egrets on the island by the works was recorded during ecological monitoring. Sign of nursery activities by Little Egret was observed in August and September 2017 on trees located at the previously identified egretry area at the southern side of Sheung Sha Chau Island. At the HDD daylighting location, neither nest nor breeding activity of birds were found during the monthly ecological monitoring and weekly site inspections in the reporting period. The site photos and location map regarding the ecological monitoring for HDD works and egretry area are provided in **Appendix E** for reference.

2.8 Audit of the SkyPier Plan

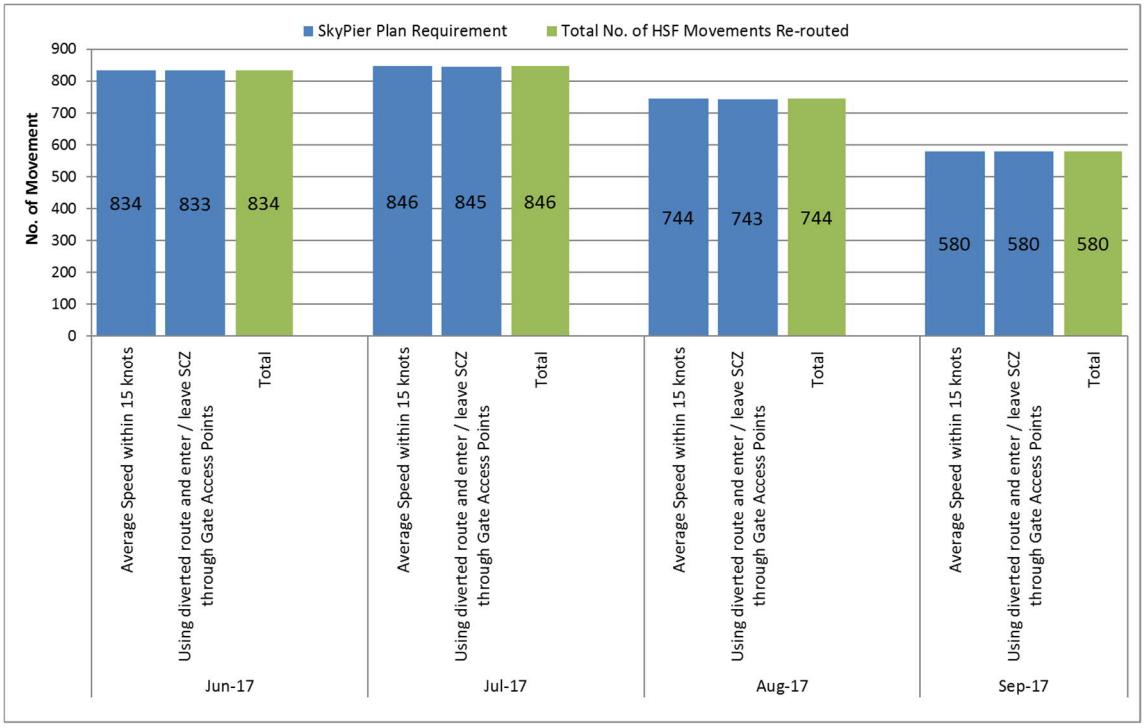
In total, 2,170 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. No vessel operated to or from Zhuhai in September 2017 as the pier facility in Zhuhai was damaged due to typhoon in late August 2017. The daily movements of all SkyPier HSFs in the reporting period ranged between 11 and 93, which falls within the maximum daily cap number of 125.

All HSFs travelled through the SCZ with average speed within 15 knots (9.6 knots to 14.1 knots), which complied with the SkyPier Plan. Two ferry movements had minor deviations from the diverted route during the reporting period. Notices of deviation were sent to the ferry operators (FOs) and the cases have been investigated. All the deviation cases from the diverted route were due to public safety considerations or emergency situations, i.e., giving way to other vessels, and the HSFs had returned to the normal route following the SkyPier Plan as soon as practicable. The summary of the SkyPier Plan monitoring result (July 2017 to September 2017) is presented in **Graph 3**.

Insufficient Automatic Identification System (AIS) data were received from some HSFs during the reporting period. After investigation, it was found AIS data for the concerned ferries was missing due to effects of interference of the signal as reported by the FO after checking the condition of

the AIS transponders. Vessel captains were requested to provide the radar track photos which indicated the vessel entered the SCZ through the gate access points and there was no speeding in the SCZ. FO's explanation has been accepted.

Graph 3: Summary of SkyPier Plan Monitoring Results (July 2017 to September 2017)



2.9 Audit of Construction and Associated Vessels

On the implementation of MTRMP-CAV, the MSS automatically recorded deviation cases such as speeding, entering no entry zone, and not traveling through the designated gate. ET conducted bi-weekly audit of relevant information including AIS data, vessel tracks and other relevant records to ensure sufficient information has been provided by the system and the contractors complied with the requirements of the MTRMP-CAV. The contactors have submitted endorsed 3-month rolling vessel plan for construction vessel activities to AAHK in order to help maintain the number of construction vessels to a practicable minimum. The IEC has also performed audit on the compliance of the requirements as part of the EM&A programme.

Between July and September 2017, deviations including speeding in the works area, entry from non-designated gates and entering no-entry zones were identified. All the concerned captains were reminded by the contractor's MTCC representative to comply with the requirements of the MTRMP-CAV.

A total of 11 skipper training workshops have been held by ET between July and September 2017 with 52 concerned captains of construction vessels associated with the 3RS Contracts to familiarise them with the predefined routes, general education on local cetaceans, guidelines for avoiding adverse water quality impact, the required environmental practices / measures while operating construction and associated vessels under the Project, and guidelines for operating vessels safely in the presence of CWDs. Another 8 skipper training workshops have been held with 11 concerned captains by contractor's Environmental Officer (EO) and competency test had been conducted subsequently with the trained captains by ET.

2.10 Coral Post-Translocation Monitoring

In accordance with the approved Coral Translocation Plan (CTP), gorgonian corals suitable for translocation were translocated to the recipient site at Yam Tsai Wan (YTW), with translocation completed in January 2017. Since then the post-translocation monitoring program has been undertaken according to the CTP. Details of the coral translocation works and the results of the first four rounds of post-translocation monitoring conducted in the period from January to March 2017 and in April 2017 are presented in the Quarterly EM&A Reports No. 5 and No. 6 respectively.

In the survey conducted in April 2017, a significant change of partial mortality (PM) and deterioration in health condition was noted in both the translocated coral (tagged) and the control corals (tagged), however, the Action/ Limit Levels as defined in the CTP were not triggered due to the PM and health deterioration occurred in both translocated and control corals. The summary of the 4th post-translocation monitoring survey conducted in April 2017 is presented in **Table 2.23**. Investigation actions were subsequently initiated as per the CTP, which stipulates that investigations shall be undertaken if observations of any die-off/ abnormal conditions are made.

Table 2.23: Summary of the 4th Post-Translocation Monitoring Surveys Completed in April 2017

	Colony Height (cm)	General Health Conditions[a]	% Change in Partial Mortality[b] [c]	Exceedance of Action Level[d]	Exceedance of Limit Level[e]
Fourth Round of Survey in April 2017					
Control gorgonian corals (tagged)	7-59	0-3 (Average: 1.9)	<25% change for 5% of the tagged corals and ⩾25% change for 95% of the tagged corals (Average PM: 73%)	No	No
Translocated gorgonian corals (tagged)	5-44	1-4 (Average: 2.0)	<25% change for 4.7% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 73%)		

Notes:

(a) General health conditions of coral were measured on an ordinal scale of 0 to 5 (0=dead, 5=very healthy).

(b) The percentage change in partial mortality of the tagged translocated and control corals are both determined by comparing the partial mortality recorded during each post-translocation monitoring with reference to the partial mortality observed during the baseline conditions, as represented by the tagged coral survey results.

(c) Coral showing no change in partial mortality is not presented in this account.

(d) As defined in the approved CTP, the Action Level is exceeded if during monitoring a 15% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.

(e) As defined in the approved CTP, the Limit Level is exceeded if during monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.

To this end, it was proposed to investigate the cause(s) of the situation, i.e. the factors leading to high PM being recorded. The following actions have been undertaken to investigate the potential cause of the mortality:

- Review of weather conditions, red tide, water quality monitoring data
- Substrate check and review of sediment deposition
- Review of other projects and their translocated corals
- Ad-hoc monthly monitoring of all translocated and control corals
- Ad-hoc dive check of natural corals in Yam Tsai Wan, Sham Shui Kok and Tai Mo To
- Ad-hoc water quality monitoring

Another focus of the action is to investigate whether the high mortality is related to the 3RS construction works. It was investigated through the actions review of water quality monitoring data, and dive check of natural corals in adjacent areas, including other sites outside recipient site in Yam Tsai Wan. Investigation works looking at the potential causes of the significant change in PM were undertaken and are continuing with the initial findings summarized below.

Monitoring Results

Ad-hoc monitoring of all translocated and control corals at recipient site

After a general check of the condition of all the translocated corals in May 2017, three rounds of ad-hoc coral dive surveys (on top of the CTP's post-translocation monitoring requirements) were conducted for both translocated corals (tagged and untagged) and control corals (tagged) at the recipient site in June, July and September 2017 The key results of the ad-hoc surveys are summarized in **Table 2.24**, which shows the health conditions and changes in PM of the tagged translocated corals are largely stabilized. Selected photos of tagged controls and translocated corals from the ad-hoc monitoring are shown in **Appendix F**.

Table 2.24: Summary of Ad-hoc Monitoring of Tagged Corals at Recipient Site

	Colony Height (cm)	General Health Conditions[a]	% Change in Partial Mortality[b] [c]	Exceedance of Action Level[d]	Exceedance of Limit Level[e]
Ad-hoc Monitoring in June 2017					
Control gorgonian corals (tagged)	7-59	0-4 (Average: 2.1)	<25% change for 5% of the tagged corals and ⩾25% change for 95% of the tagged corals (Average PM: 73.5%)	No	No
Translocated gorgonian corals (tagged)	5-44	0-4 (Average: 2.0)	<25% change for 5.9% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 73.8%)		
Ad-hoc Monitoring in July 2017					
Control gorgonian corals (tagged)	7-59	0-5 (Average: 2.9)	<25% change for 10% of the tagged corals and ⩾25% change for 90% of the tagged corals (Average PM: 68.8%)	No	No

	Colony Height (cm)	General Health Conditions[(a)]	% Change in Partial Mortality[(b) (c)]	Exceedance of Action Level[(d)]	Exceedance of Limit Level[(e)]
Translocated gorgonian corals (tagged)	5-44	0-5 (Average: 3.0)	<25% change for 5.9% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 72.7%)		
Ad-hoc Monitoring in September 2017					
Control gorgonian corals (tagged)	7-59	0-5 (Average: 2.7)	<25% change for 10% of the tagged corals and ⩾25% change for 90% of the tagged corals (Average PM: 67.8%)	No	No
Translocated gorgonian corals (tagged)	5-44	0-4 (Average: 2.3)	<25% change for 5.9% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 76.9%)		

Notes:
(a) General health conditions of coral were measured on an ordinal scale of 0 to 5 (0=dead, 5=very healthy).
(b) The percentage change in partial mortality of the tagged translocated and control corals are both determined by comparing the partial mortality recorded during each post-translocation monitoring with reference to the partial mortality observed during the baseline conditions, as represented by the tagged coral survey results.
(c) Coral showing no change in partial mortality is not presented in this account.
(d) As defined in the approved CTP, the Action Level is exceeded if during monitoring a 15% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.
(e) As defined in the approved CTP, the Limit Level is exceeded if during monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.

Ad-hoc Dive Surveys of Natural Corals at Yam Tsai Wan, Sham Shui Kok and Tai Mo To

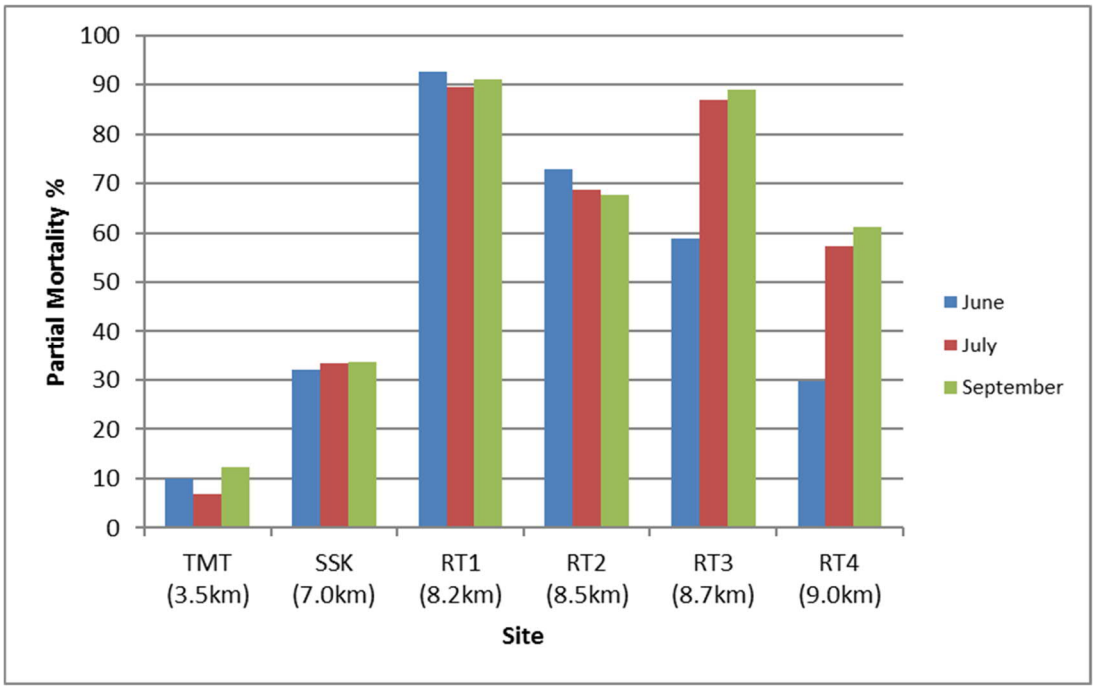
In addition to the ad-hoc surveys at the recipient site in YTW (RT2), natural coral monitoring was also conducted at three other locations in YTW (namely, RT1, RT3 and RT4), Tai Mo To (TMT) and Sham Shui Kok (SSK), each with 20 tagged coral colonies, in June, July and September 2017 for comparison with the survey findings at the recipient site. The locations of all the survey sites are as illustrated in **Figure 2.11.** The monitoring results of these five localities are compared with those of the control (natural) corals at the recipient site RT2, as summarized in **Table 2.25** and presented graphically in **Graph 4**. It can be seen from the comparison that while the two survey locations at TMT and SSK are much closer to the 3RS project site than the four locations at YTW (RT1, RT2, RT3 and RT4), the average PM levels of natural corals (tagged) at TMT and SSK are generally lower than those at the four YTW locations. Hence, it is evident from the comparison of findings that the relatively high PM levels at YTW not likely to be related to the 3RS marine works activities but, rather, seem to have been a discrete incident.

Figure 2.11: Locations of Six Coral Dive Survey Sites

Table 2.25: Comparison of tagged natural coral survey results at six survey sites

	TMT	SSK	RT1	RT2 (recipient site)	RT3	RT4
Distance from 3RS project site boundary	3.5km	7.0km	8.2km	8.5km	8.7km	9.0km
Average Partial Mortality						
June 2017	10.0%	32.1%	92.8%	73.5%	58.8%	29.8%
July 2017	6.8%	33.3%	89.5%	68.8%	87.0%	57.3%
September 2017	12.3%	33.8%	91.0%	67.8%	89.0%	61.3%
Average Health Condition						
June 2017	4.8	3.7	0.9	2.1	3.2	4.0
July 2017	4.7	4.5	1.2	2.9	3.0	3.5
September 2017	3.2	1.8	1.2	2.7	1.4	2.3

Graph 4: Comparison of Average Partial Mortality of Tagged Natural Corals at Six Survey Sites



Review of Various Environmental Conditions

As part of the follow up investigations, a number of environmental factors and conditions were investigated covering the periods before and after the significant change in the tagged and control corals PM at the recipient site were reviewed. Review findings at the time of compiling this quarterly report are summarised as follows:

- ***Review of weather conditions:*** Relevant information available from the Hong Kong Observatory was reviewed and no obvious weather events, e.g. strong monsoon signal, typhoon and cold weather warning, that could potentially affect coral health conditions were identified during the period January to April 2017, before the significant change of PM was identified.
- ***Review of any reported red tides/ algal blooms that may have affected Yam Tsai Wan:*** According to information available from AFCD, no red tides were reported during the period from January to April 2017, before the significant change of PM. However, according to a University of Hong Kong coral specialist consulted by the ET, algal bloom incidents were observed at Kap Shui Mun, Sham Wat and Tai O during the coral specialist's dive survey in January 2017. The bloom resembles *Microcystis sp.* which is known to produce hepatoxins and these have been found to have chronic harmful effects on fish and shellfish. These observations suggest that harmful algal blooms may have occurred in some parts of north Lantau waters quite close to Yam Tsai Wan and might have residual effect to the site, and there is a possibility that these may have been associated with the significant change of PM at the recipient site.
- ***Review of water quality:*** Relevant water quality parameters including pH, DO, temperature, salinity and total alkalinity, were measured at all the six survey sites in June, July and September 2017 in conjuncture with the coral monitoring. Most of the parameters (including

SS, turbidity, pH, salinity, DO and temperature) at the six sites with ad-hoc water quality monitoring generally fell within natural fluctuations at Station C3 in between January and September 2017. Results indicated that rate of salinity drop was higher in 2017 as compared to 2016 in the area surrounding recipient site, and higher water temperature was recorded in 2017 than 2016. There was also a decrease in DO in wet season. Hence the corals might have been exposed to an interplay of environmental stresses, including salinity, DO and thermal stresses that created unfavourable conditions for them.

- ***Review of sediment deposition:*** sediment trap data was retrieved in late September and the analysis works are undertaken in October which will be report in next reporting period.

2.11 Review of the Key Assumptions Adopted in the EIA Report

With reference to Appendix E of the Manual, it is noted that the key assumptions adopted in approved EIA report for the construction phase are still valid and no major changes are involved. The environmental mitigation measures recommended in the approved EIA Report remain applicable and shall be implemented in undertaking construction works for the Project.

3 Report on Non-compliance, Complaints, Notifications of Summons and Prosecutions

3.1 Compliance with Other Statutory Environmental Requirements

During the reporting period, environmental related licenses and permits required for the construction activities were checked. No non-compliance with environmental statutory requirements was recorded.

3.2 Analysis and Interpretation of Complaints, Notification of Summons and Status of Prosecutions

3.2.1 Complaints

Two environment-related complaints were received on 8 August and 5 September 2017 regarding sand filling materials of Contract 3206. Apart from the investigation conducted by AAHK under the contractual aspect, investigation on environmental aspect was also conducted by the ET in accordance with the Complaint Management Plan of the Project. According to the EP condition 2.26, a maximum of 10% fines content should be adopted for sand blanket. The ET has been conducting checking of test reports on particle size distribution of sand materials and witnessing sand sampling of the Project on a regular basis. The ET also reviewed water quality monitoring results of the 3RS EM&A programme obtained 3 months preceding the complaint (i.e. May, June and July 2017) to check for any exceedance cases of suspended solids close to the location of sand blanket laying activities of Contract 3206. It was found that there were no exceedances of Action or Limit levels for suspended solids at all impact monitoring stations from May to July 2017. The ET had checked and would continue to check the test reports on particle size distribution of sand materials and to witness sand sampling of the Project on a regular basis. To date, no non-compliance against the EP condition of a maximum of 10% fines content was identified.

3.2.2 Notifications of Summons or Status of Prosecution

Neither notification of summons now prosecution was received during the reporting period.

3.3 Cumulative Statistics

Cumulative statistics on exceedance, non-compliance, complaints, notifications of summons and status of prosecutions are summarized in **Table 3.1** and **Table 3.2**.

Table 3.1: Statistics for Valid Exceedances for the Environmental Monitoring

		Total No. Recorded in the Reporting Period	Total No. Recorded since the Project Commenced
1-hr TSP	Action	0	0
	Limit	0	0
Noise	Action	0	0
	Limit	0	0
Waste	Action	0	0
	Limit	0	0
Water	Action	0	0

		Total No. Recorded in the Reporting Period	Total No. Recorded since the Project Commenced
	Limit	0	0
CWD	Action	0	0
	Limit	0	0

Remark: Exceedances which are not project related are not shown in this table.

Table 3.2: Statistics for Non-compliance, Complaints, Notifications of Summons and Prosecution

Reporting Period	Cumulative Statistics			
	Non-compliance	Complaints	Notifications of Summons	Prosecutions
This reporting period	0	2	0	0
From 28 December 2015 to end of the reporting period	0	7	1	0

4 Conclusion and Recommendation

In this quarterly period from 1 July 2017 to 30 September 2017, the EM&A programme has been implemented as planned, including 102 sets of air quality measurements, 65 sets of construction noise measurements, 40 sets of water quality measurements, 6 complete sets of vessel line-transect surveys and 15 days of land-based theodolite tracking survey effort for CWD monitoring, 2 rounds of terrestrial ecology monitoring, as well as environmental site inspections and waste monitoring for the Project's construction works.

The key activities of the Project carried out in the reporting period included DCM works and trials, laying of geotextile and sand blanket, site preparation works, site office establishment, seawall construction, HDD works, concrete removal works, piling, and excavation works.

No exceedance of Action or Limit Levels in relation to construction dust, construction noise, construction waste, and CWD monitoring was recorded in the reporting period. All site observations made by the ET were recorded in the site inspection checklists and passed to the contractor together with the recommended follow-up actions.

For water quality, the water quality monitoring results for total alkalinity and chromium obtained during the reporting period did not exceed their corresponding Action and Limit Levels stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme if being exceeded. For DO, turbidity, SS, and nickel, some of the testing results exceeded the relevant Action or Limit Levels in the reporting period, and the corresponding investigations were conducted accordingly. The investigation findings concluded that the exceedances were not due to the Project.

In total, 2,170 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. All HSFs travelled through the SCZ with average speed within 15 knots, which complied with the SkyPier Plan. Two ferry movements had minor deviations from the diverted route during the reporting period. ET investigated the deviation cases and all of them are related to public safety / emergency situations.

Between July and September 2017, ET has conducted bi-weekly audit of the MSS to ensure the system records all deviation cases accurately and the contractors fully complied with the requirements of the MTRMP-CAV. A total of 11 skipper training workshops have been held by ET between July to September 2017 with concerned captains of construction vessels associated with 3RS contracts. Another 8 skipper training workshops have been held by contractors' EO and competency test had been conducted subsequently with the trained captains by ET.

On the implementation of MMWP, dolphin observers were deployed by the contractors for laying of open sea silt curtain and laying of silt curtains for sand blanket in accordance with the plan. On the implementation of DEZ Plan, dolphin observers were deployed for continuous monitoring of the DEZ by the contractors for DCM works and seawall construction in accordance with the DEZ Plan. Trainings for the proposed dolphin observers were provided by the ET prior to the aforementioned works, with the training records kept by the ET. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine mammals were observed within or around the silt curtains, whilst there were four records of dolphin sighting within the DEZ of DCM works in this reporting period. Audits of acoustic decoupling for construction vessels were also carried out by ET.

Subsequent to completion of the coral translocation works, in accordance with the approved CTP, a summary of the post-translocation monitoring and findings is reported quarterly.

The recommended environmental mitigation measures, as included in the EM&A programme, have been effectively implemented during the reporting period. Also, the EM&A programme implemented by the ET has effectively monitored the construction activities and ensure the proper implementation of mitigation measures.

Figures

824000 N
822000 N
820000 N
818000 N
804000 E
806000 E
808000 E
810000 E
812000 E
814000 E

Contract P560 (R)-
Daylighting
Location

LEGEND:
- LAND FORMATION
- TEMPORARY WORKS AREA BOUNDARY
- KEY CONSTRUCTION ACTIVITIES

RECLAMATION WORKS AREA
(please refer to Figure 1.2)

Contract 3801 - Works Area
Contract 3501 - Works Area
Contract 3602 - Works Area
Contract 3502 - Works Area
Contract 3201- 3206
and AAHK Site
Offices
Contract P560 (R)-
Launching Site
Contract P560 (R) - Site Office
Contract 3501 - Stockpiling Area
Contract P560 (R) - Stockpiling Area

0 250 500 750 1000 m
1 : 30 000 SCALE BAR

Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC

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Mott MacDonald

Title

LOCATIONS OF KEY CONSTRUCTION ACTIVITIES IN THIS REPORTING PERIOD

Consultant's Signatures for Approval		Date
Design	DC	31AUG15
Checkers	DC	31AUG15
Design Supervisor	EC	31AUG15
Authorised Representative	JFP	31AUG15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No.
FIGURE 1.1

Scale at A3
1 : 30000

Rev.
A

Filename: J:\355482\REPORT\ENV\CWSLP\FIG 1.dgn

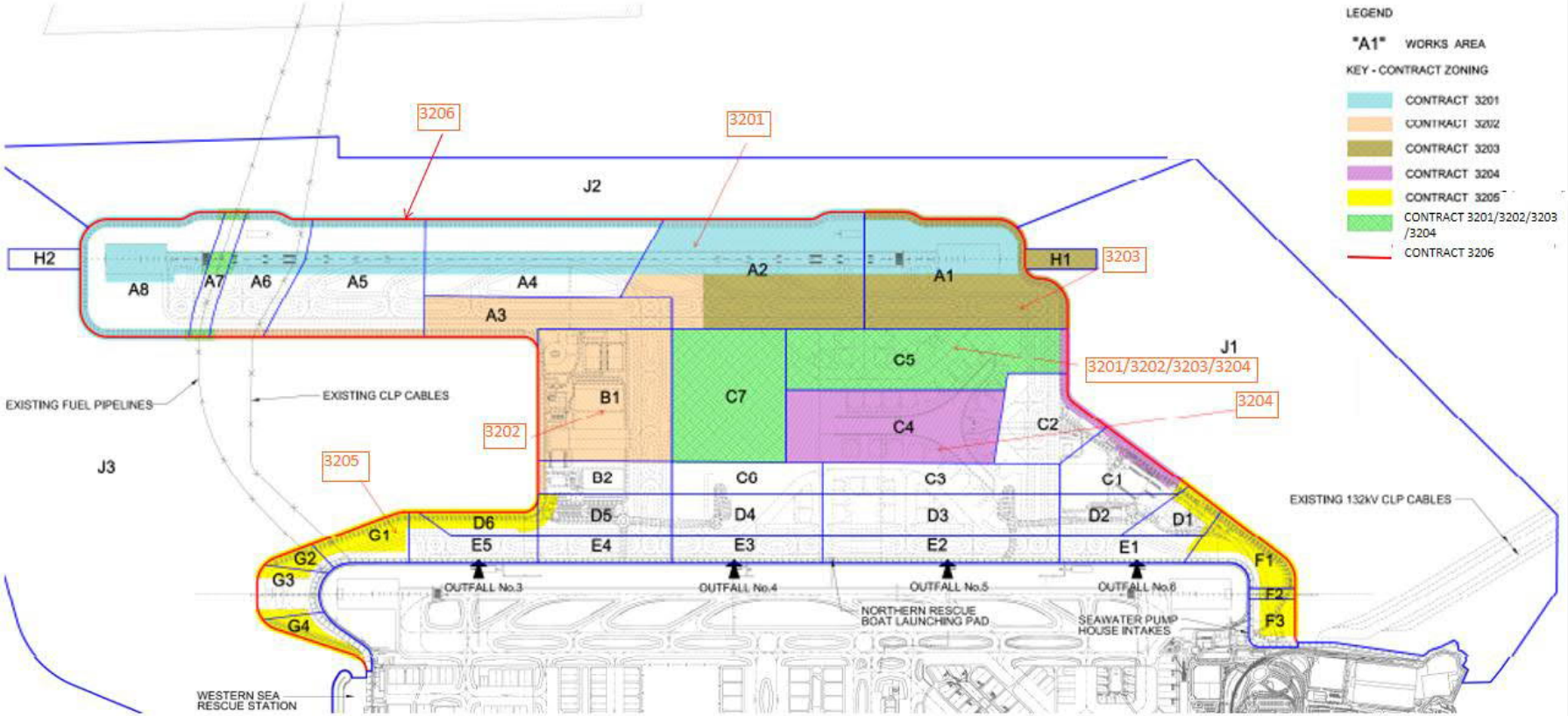

FIGURE 1.2- LOCATIONS OF RECLAMATION WORKS AREA

LEGEND:

- LAND FORMATION
- NOISE MONITORING STATION (UPDATED EM&A MANUAL)
- AIR QUALITY MONITORING STATION (UPDATED EM&A MANUAL)
- CHEK LAP KOK WIND STATION

806000 E
808000 E
810000 E
812000 E
814000 E
820000 N
818000 N

NM1A
AR1A
NM2
NM3A
NM4
NM5
AR2
NM6

0 200 400 600 800 1000 m
1 : 22 500 SCALE BAR

Rev.	Date	Description	Checked
A	06JAN16	FIRST ISSUE	RO
B	29JAN16	GENERAL REVISION	RO
C	11FEB16	GENERAL REVISION	RO

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Title

LOCATIONS OF AIR AND NOISE MONITORING STATIONS AND CHEK LAP KOK WIND STATION

Consultant's Signatures for Approval		Date
Design	AM	11FEB16
Checkers	AM / TK	11FEB16
Approver	EC	11FEB16

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No.

FIGURE 2.1

Scale at A3 1 : 22500

Rev. C

Filename: J:\355482\REPORT\ENV\EMA\160211\FIG 2.1.dgn

805000 E
810000 E
815000 E
820000 E
825000 N
820000 N
815000 N
HKSAR BOUNDARY
C1
C2
C3
IM1
IM2
IM3
IM4
IM5
IM6
IM7
IM8
IM9
IM10
IM11
IM12
IM13
SR2
SR3
SR4A
SR5A
SR6
SR7
SR8
LEGEND:
LAND FORMATION
500m ENVELOPE
IMPACT STATION
SENSITIVE RECEIVER
CONTROL STATION
MOBILE IMPACT STATION
0 500 1000 1500 2000 m
1 : 60 000 SCALE BAR

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	DC
B	04MAY16	GENERAL REVISION	RO
C	06JUN16	GENERAL REVISION	LC

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Mott MacDonald

Title

WATER QUALITY MONITORING STATIONS

Consultant's Signatures for Approval		Date
Design	DC	06JUN16
Checkers	DC / TK	06JUN16
Approver	EC	06JUN16

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

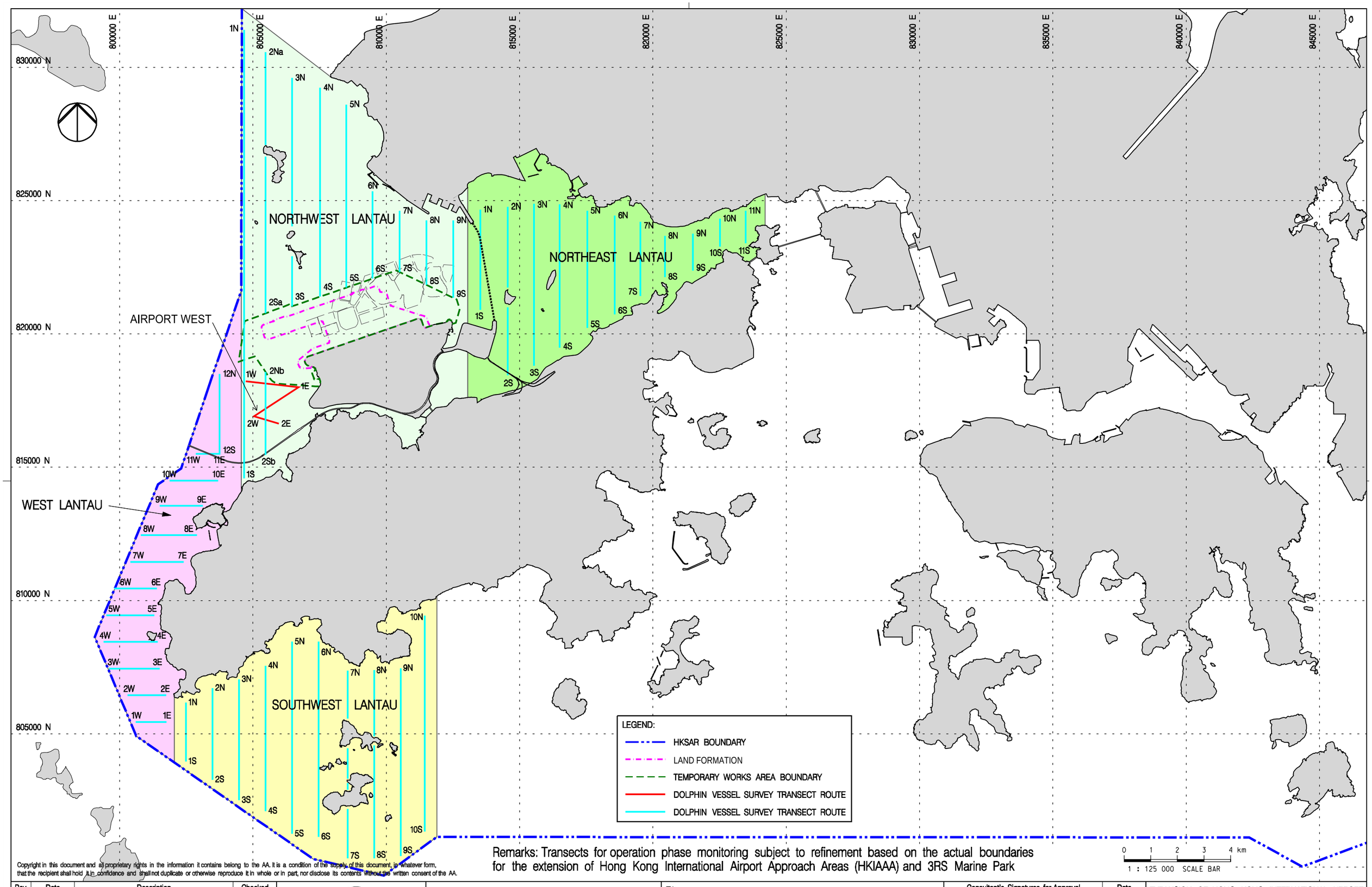
Drawing No.

FIGURE 2.2

Scale at A3 1 : 60000

Rev. C

Filename: J:\355482\REPORT\ENV\EMA\160606\MCL-P132-EMA-5-002.dgn



Remarks: Transects for operation phase monitoring subject to refinement based on the actual boundaries for the extension of Hong Kong International Airport Approach Areas (HKIAAA) and 3RS Marine Park

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	JC
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C	06FEB17	GENERAL REVISION	JT
D	01MAR17	GENERAL REVISION	JT

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MOTT MACDONALD

Title

VESSEL BASED DOLPHIN MONITORING TRANSECTS IN CONSTRUCTION, POST-CONSTRUCTION AND OPERATION PHASES

Consultant's Signatures for Approval		Date
Design	JC	01MAR17
Checkers	JC / TK	01MAR17
Approver	EC	01MAR17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No. FIGURE 2.3

Scale at A3 1 : 125000

Rev. D

Filename: J:\355482\REPORT\ENV\EMA\170301\MCL-P132-EMA-10-003.dgn

804000 E
806000 E
808000 E
810000 E
812000 E
814000 E
816000 E
818000 E
820000 N
822000 N
824000 N
826000 N

E
D

RUMSTON ROAD

HKSAR BOUNDARY

LEGEND:
LAND FORMATION
HONG KONG INTERNATIONAL AIRPORT
LAND BASED SURVEY LOCATION

0 500 1000 1500 2000 m
1 : 45,000 SCALE BAR

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	JC
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Title

LAND BASED DOLPHIN MONITORING IN BASELINE AND CONSTRUCTION PHASES

Consultant's Signatures for Approval		Date
Design	JC	06FEB17
Checkers	JC / TK	06FEB17
Approver	EC	06FEB17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

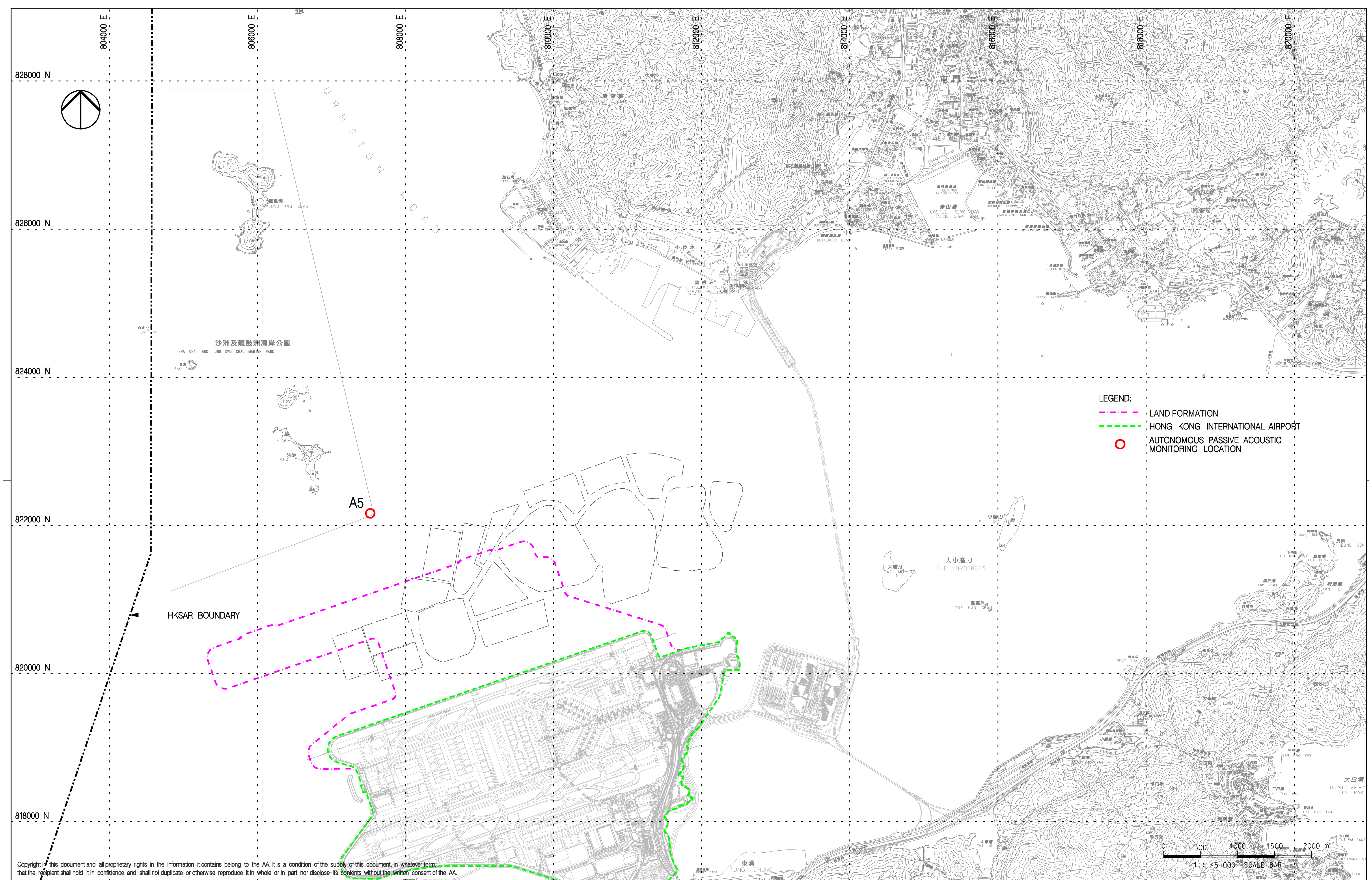
Drawing No.

FIGURE 2.4

Scale at A3 1 : 45000

Rev. B

Filename: J:\355482\REPORT\ENV\EMA\170206\MCL-P132-EMA-10-004.dgn



804000 E
806000 E
808000 E
810000 E
812000 E
814000 E
816000 E
818000 E
820000 E
828000 N
826000 N
824000 N
822000 N
820000 N
818000 N
URMSTON ROAD
沙洲及龍鼓洲海岸公園
SHA CHAU AND LUNG KWU CHAU MARINE PARK
A5
HKSAR BOUNDARY
大小磨刀
THE BROTHERS
LEGEND:
LAND FORMATION
HONG KONG INTERNATIONAL AIRPORT
AUTONOMOUS PASSIVE ACOUSTIC MONITORING LOCATION
0 500 1000 1500 2000 m
1 : 45 000 SCALE BAR

Rev.	Date	Description	Checked
A	29AUG17	FIRST ISSUE	JT
B	10OCT17	GENERAL REVISION	PL

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MOTT MACDONALD

Title

LOCATION FOR AUTONOMOUS PASSIVE ACOUSTIC MONITORING

Consultant's Signatures for Approval		Date
Design	JC	10OCT17
Checkers	JC / TK	10OCT17
Approver	EC	10OCT17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

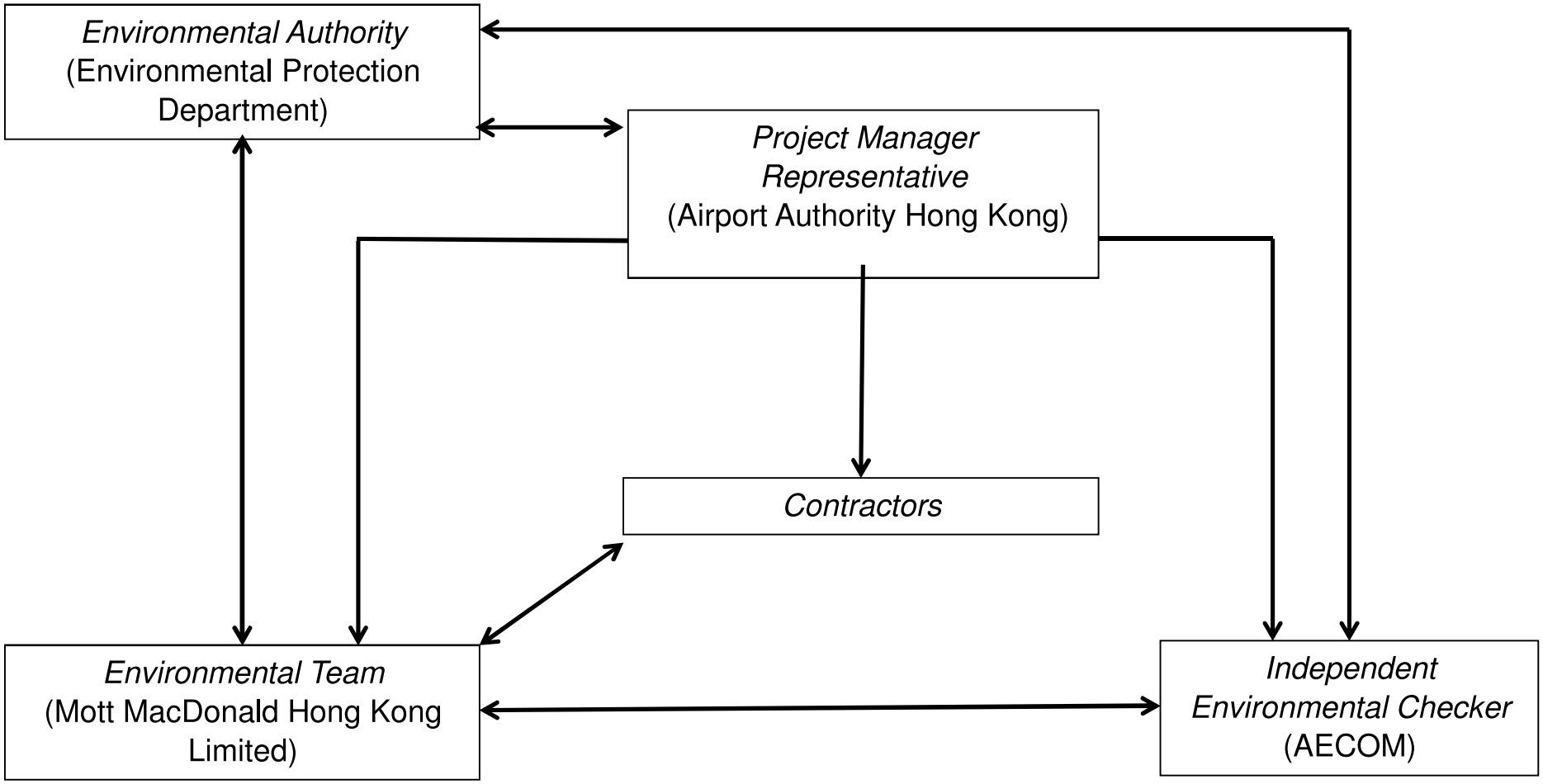
Drawing No. FIGURE 2.10

Scale at A3 1 : 45000

Rev. B

Filename: J:\355482\REPORT\ENV\EMA\171010\FIG 6.5.dgn

Appendix A. Project Organization Chart


Environmental Authority
(Environmental Protection Department)
Project Manager Representative
(Airport Authority Hong Kong)
Contractors
Environmental Team
(Mott MacDonald Hong Kong Limited)
Independent Environmental Checker
(AECOM)

Appendix B. Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

Appendix B Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Air Quality Impact – Construction Phase		
5.2.6.2	2.1	-	**Dust Control Measures** ▪ Water spraying for 12 times a day or once every two hours for 24-hour working at all active works area.	Within construction site / Duration of the construction phase	I
5.2.6.3	2.1	-	▪ Covering of at least 80% of the stockpiling area by impervious sheets. Water spraying of all dusty materials immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling.	Within construction site / Duration of the construction phase	I
5.2.6.4	2.1	-	Dust control practices as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted. These practices include: Good Site Management ▪ Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning.	Within construction site / Duration of the construction phase	I
			Disturbed Parts of the Roads ▪ Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or ▪ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.	Within construction site / Duration of the construction phase	I
			Exposed Earth ▪ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies.	Within construction site / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Loading, Unloading or Transfer of Dusty Materials ▪ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.	Within construction site / Duration of the construction phase	I
			Debris Handling ▪ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides; and ▪ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.	Within construction site / Duration of the construction phase	I
			Transport of Dusty Materials ▪ Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards.	Within construction site / Duration of the construction phase	I
			Wheel washing ▪ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.	Within construction site / Duration of the construction phase	I
			Use of vehicles ▪ The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site; ▪ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels; and ▪ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.	Within construction site / Duration of the construction phase	I
			Site hoarding ▪ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.	Within construction site / Duration of the construction phase	I
5.2.6.5	2.1	-	**Best Practices for Concrete Batching Plant** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2 as well as in the future Specified Process licence should be adopted. The best practices are recommended to be applied to both the land based and floating concrete batching plants. Best practices include: Cement and other dusty materials	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ The loading, unloading, handling, transfer or storage of cement, pulverised fuel ash (PFA) and/or other equally dusty materials shall be carried in a totally enclosed system acceptable to EPD. All dust-laden air or waste gas generated by the process operations shall be properly extracted and vented to fabric filtering system to meet the required emission limit; ▪ Cement, PFA and/or other equally dusty materials shall be stored in storage silo fitted with audible high level alarms to warn of over-filling. The high-level alarm indicators shall be interlocked with the material filling line such that in the event of the silo approaching an overfilling condition, an audible alarm will operate, and after 1 minute or less the material filling line will be closed; ▪ Vents of all silos shall be fitted with fabric filtering system to meet the required emission limit; ▪ Vents of cement/PFA weighing scale shall be fitted with fabric filtering system to meet the required emission limit; and ▪ Seating of pressure relief valves of all silos shall be checked, and the valves re-seated if necessary, before each delivery.		
			Other raw materials ▪ The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rock, sand, stone aggregate, shall be carried out in such a manner to prevent or minimize dust emissions; ▪ The materials shall be adequately wetted prior to and during the loading, unloading and handling operations. Manual or automatic water spraying system shall be provided at all unloading areas, stock piles and material discharge points; ▪ All receiving hoppers for unloading relevant materials shall be enclosed on three sides up to 3 m above the unloading point. In no case shall these hoppers be used as the material storage devices; ▪ The belt conveyor for handling materials shall be enclosed on top and two sides with a metal board at the bottom to eliminate any dust emission due to wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can achieve same performance; ▪ All conveyor transfer points shall be totally enclosed. Openings for the passage of conveyors shall be fitted with adequate flexible seals; ▪ Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface; ▪ Conveyors discharged to stockpiles of relevant materials shall be arranged to minimize free fall as far as practicable. All free falling transfer points from conveyors to stockpiles shall be enclosed with chute(s) and water sprayed; ▪ Aggregates with a nominal size less than or equal to 5 mm should be stored in totally enclosed structure such as storage bin and should not be handled in open area. Where there is sufficient buffer area surrounding the concrete batching plant, ground stockpiling may be used;	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side; ▪ Aggregates with a nominal size greater than 5 mm should preferably be stored in a totally enclosed structure. If open stockpiling is used, the stockpile shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping; and ▪ The opening between the storage bin and weighing scale of the materials shall be fully enclosed.		
			Loading of materials for batching ▪ Concrete truck shall be loaded in such a way as to minimise airborne dust emissions. The following control measures shall be implemented: (a) Pre-mixing the materials in a totally enclosed concrete mixer before loading the materials into the concrete truck is recommended. All dust-laden air generated by the pre-mixing process as well as the loading process shall be totally vented to fabric filtering system to meet the required emission limit; and (b) If truck mixing batching or other types of batching method is used, effective dust control measures acceptable to EPD shall be adopted. The dust control measures must have been demonstrated to EPD that they are capable to collect and vent all dust-laden air generated by the material loading/mixing to dust arrestment plant to meet the required emission limit. ▪ The loading bay shall be totally enclosed during the loading process.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Vehicles ▪ All practicable measures shall be taken to prevent or minimize the dust emission caused by vehicle movement; and ▪ All access and route roads within the premises shall be paved and adequately wetted.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Housekeeping ▪ A high standard of housekeeping shall be maintained. All spillages or deposits of materials on ground, support structures or roofs shall be cleaned up promptly by a cleaning method acceptable to EPD. Any dumping of materials at open area shall be prohibited.	Within Concrete Batching Plant / Duration of the construction phase	N/A
5.2.6.6	2.1	-	**Best Practices for Asphaltic Concrete Plant** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Tar and Bitumen Works (Asphaltic Concrete Plant) BPM 15 (94) as well as in the future Specified Process licence should be adopted. These include: Design of Chimney ▪ The chimney shall not be less than 3 metres plus the building height or 8 metres above ground level, whichever is the greater; ▪ The efflux velocity of gases from the main chimney shall not be less than 12 m/s at full load condition;	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ The flue gas exit temperature shall not be less than the acid dew point; and ▪ Release of the chimney shall be directed vertically upwards and not be restricted or deflected.		
			Cold feed side ▪ The aggregates with a nominal size less than or equal to 5 mm shall be stored in totally enclosed structure such as storage bin and shall not be handled in open area; ▪ Where there is sufficient buffer area surrounding the plant, ground stockpiling may be used. The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side. If these aggregates are stored above the feeding hopper, they shall be enclosed at least on top and three sides and be wetted on the surface to prevent wind-whipping; ▪ The aggregates with a nominal size greater than 5 mm should preferably be stored in totally enclosed structure. Aggregates stockpile that is above the feeding hopper shall be enclosed at least on top and three sides. If open stockpiling is used, the stockpiles shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping; ▪ Belt conveyors shall be enclosed on top and two sides and provided with a metal board at the bottom to eliminate any dust emission due to the wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can be achieve the same performance; ▪ Scrapers shall be provided at the turning points of all belt conveyors inside the chute of the transfer points to remove dust adhered to the belt surface; ▪ All conveyor transfer points shall be totally enclosed. Openings for the passages of conveyors shall be fitted with adequate flexible seals; and ▪ All materials returned from dust collection system shall be transferred in enclosed system and shall be stored inside bins or enclosures.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Hot feed side ▪ The inlet and outlet of the rotary dryer shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter. The particulate and gaseous concentration at the exhaust outlet of the dust collector shall not exceed the required limiting values; ▪ The bucket elevator shall be totally enclosed and the air be extracted and ducted to a dust collection system to meet the required particulates limiting value; ▪ All vibratory screens shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings; ▪ Chutes for carrying hot material shall be rigid and preferably fitted with abrasion resistant plate inside. They shall be inspected daily for leakages;	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ All hot bins shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings. The air shall be extracted and ducted to a dust collection system to meet the required particulates limiting value; and ▪ Appropriate control measures shall be adopted in order to meet the required bitumen emission limit as well as the ambient odour level (2 odour units).		
			Material transportation ▪ The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rocks, sands, stone aggregates, reject fines, shall be carried out in such a manner as to minimize dust emissions; ▪ Roadways from the entrance of the plant to the product loading points and/or any other working areas where there are regular movements of vehicles shall be paved or hard surfaced; and ▪ Haul roads inside the Works shall be adequately wetted with water and/or chemical suppressants by water trucks or water sprayers.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Control of emissions from bitumen decanting ▪ The heating temperature of the particular bitumen type and grade shall not exceed the corresponding temperature limit of the same type listed in Appendix 1 of the Guidance Note; ▪ Tamper-free high temperature cut-off device shall be provided to shut off the fuel supply or electricity in case the upper limit for bitumen temperature is reached; ▪ Proper chimney for the discharge of bitumen fumes shall be provided at high level; ▪ The emission of bitumen fumes shall not exceed the required emission limit; and The air-to-fuel ratio shall be properly controlled to allow complete combustion of the fuel. The fuel burners, if any, shall be maintained properly and free from carbon deposits in the burner nozzles.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Liquid fuel ▪ The receipt, handling and storage of liquid fuel shall be carried out so as to prevent the release of emissions of organic vapours and/or other noxious and offensive emissions to the air.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Housekeeping ▪ A high standard of housekeeping shall be maintained. Waste material, spillage and scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared frequently. The minimum clearing frequency is on a weekly basis.	Within Concrete Batching Plant / Duration of the construction phase	N/A
5.2.6.7	2.1	-	**Best Practices for Rock Crushing Plants** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Mineral Works (Stone Crushing Plant) BPM 11/1 (95) as well as in the future Specified Process licence should be adopted. These include:	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Crushers ▪ The outlet of all primary crushers, and both inlet and outlet of all secondary and tertiary crushers, if not installed inside a reasonably dust tight housing, shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter; ▪ The inlet hopper of the primary crushers shall be enclosed on top and 3 sides to contain the emissions during dumping of rocks from trucks. The rock while still on the trucks shall be wetted before dumping; ▪ Water sprayers shall be installed and operated in strategic locations at the feeding inlet of crushers; and ▪ Crusher enclosures shall be rigid and be fitted with self-closing doors and close-fitting entrances and exits. Where conveyors pass through the crusher enclosures, flexible covers shall be installed at entries and exits of the conveyors to the enclosure.		
			Vibratory screens and grizzlies ▪ All vibratory screens shall be totally enclosed in a housing. Screenhouses shall be rigid and reasonably dust tight with self-closing doors or close-fitted entrances and exits for access. Where conveyors pass through the screenhouse, flexible covers shall be installed at entries and exits of the conveyors to the housing. Where containment of dust within the screenhouse structure is not successful then a dust extraction and collection system shall be provided; and ▪ All grizzlies shall be enclosed on top and 3 sides and sufficient water sprayers shall be installed at their feeding and outlet areas.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Belt conveyors ▪ Except for those conveyors which are placed within a totally enclosed structure such as a screenhouse or those erected at the ground level, all conveyors shall be totally enclosed with windshield on top and 2 sides; ▪ Effective belt scraper such as the pre-cleaner blades made by hard wearing materials and provided with pneumatic tensioner, or equivalent device, shall be installed at the head pulley of designated conveyor as required to dislodge fine dust particles that may adhere to the belt surface and to reduce carry-back of fine materials on the return belt. Bottom plates shall also be provided for the conveyor unless it has been demonstrated that the corresponding belt scraper is effective and well maintained to prevent falling material from the return belt; and ▪ Except for those transfer points which are placed within a totally enclosed structure such as a screenhouse, all transfer points to and from conveyors shall be enclosed. Where containment of dust within the enclosure is not successful, then water sprayers shall be provided. Openings for any enclosed structure for the passage of conveyors shall be fitted with flexible seals.	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Storage piles and bins ▪ Where practicable, free falling transfer points from conveyors to stockpiles shall be fitted with flexible curtains or be enclosed with chutes designed to minimize the drop height. Water sprays shall also be used where required. ▪ The surface of all surge piles and stockpiles of blasted rocks or aggregates shall be kept sufficiently wet by water spraying wherever practicable; ▪ All open stockpiles for aggregates of size in excess of 5 mm shall be kept sufficiently wet by water spraying where practicable; or ▪ The stockpiles of aggregates 5 mm in size or less shall be enclosed on 3 sides or suitably located to minimize wind-whipping. Save for fluctuations in stock or production, the average stockpile shall stay within the enclosure walls and in no case the height of the stockpile shall exceed twice the height of the enclosure walls. ▪ Scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared regularly.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Rock drilling equipment ▪ Appropriate dust control equipment such as a dust extraction and collection system shall be used during rock drilling activities.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Hazard to Human Life – Construction Phase		
Table 6.40	3.2	-	▪ Precautionary measures should be established to request barges to move away during typhoons.	Construction Site / Construction Period	I
Table 6.40	3.2	-	▪ An appropriate marine traffic management system should be established to minimize risk of ship collision.	Construction Site / Construction Period	I
Table 6.40	3.2	-	▪ Location of all existing hydrant networks should be clearly identified prior to any construction works.	Construction Site / Construction Period	I
			Noise Impact – Construction Phase		
7.5.6	4.3	-	**Good Site Practice** Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: ▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; ▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum;	Within the Project site / During construction phase / Prior to commencement of operation	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; ▪ mobile plant should be sited as far away from NSRs as possible; and ▪ material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.		
7.5.6	4.3	-	**Adoption of QPME** ▪ QPME should be adopted as far as applicable.	Within the Project site / During construction phase / Prior to commencement of operation	I
7.5.6	4.3	-	**Use of Movable Noise Barriers** ▪ Movable noise barriers should be placed along the active works area and mobile plants to block the direct line of sight between PME and the NSRs.	Within the Project site / During construction phase / Prior to commencement of operation	I
7.5.6	4.3	-	**Use of Noise Enclosure/ Acoustic Shed** ▪ Noise enclosure or acoustic shed should be used to cover stationary PME such as air compressor and generator.	Within the Project site / During construction phase / Prior to commencement of operation	I
			Water Quality Impact – Construction Phase		

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
8.8.1.2 and 8.8.1.3	5.1	2.26	**Marine Construction Activities** <u>General Measures to be Applied to All Works Areas</u> ▪ Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; ▪ Use of Lean Material Overboard (LMOB) systems shall be prohibited; ▪ Excess materials shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessels are moved; ▪ Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; ▪ Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; ▪ All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; ▪ The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site; and ▪ For ground improvement activities including DCM, the wash water from cleaning of the drilling shaft should be appropriately treated before discharge. The Contractor should ensure the waste water meets the WPCO/TM requirements before discharge. No direct discharge of contaminated water is permitted.	Within construction site / Duration of the construction phase	I
			<u>Specific Measures to be Applied to All Works Areas</u> ▪ The daily maximum production rates shall not exceed those assumed in the water quality assessment in the EIA report; ▪ A maximum of 10 % fines content to be adopted for sand blanket and 20 % fines content for marine filling below +2.5 mPD prior to substantial completion of seawall (until end of Year 2017) shall be specified in the works contract document;	Within construction site / Duration of the construction phase	I
			▪ An advance seawall of at least 200m to be constructed (comprising either rows of contiguous permanent steel cells completed above high tide mark or partially completed seawalls with rock core to high tide mark and filter layer on the inner side) prior to commencement of marine filling activities;		N/A
			▪ Closed grab dredger shall be used to excavate marine sediment; ▪ Silt curtains surrounding the closed grab dredger shall be deployed in accordance with the Silt Curtain Deployment Plan; and		N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ The Silt Curtain Deployment Plan shall be implemented.		I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			<u>Specific Measures to be Applied to Land Formation Activities prior to Commencement of Marine Filling Works</u> ▪ Double layer 'Type III' silt curtains to be applied around the active eastern works areas prior to commencement of sand blanket laying activities. The silt curtains shall be configured to minimise SS release during ebb tides. A silt curtain efficiency test shall be conducted to validate the performance of the silt curtains;	Within construction site / Duration of the construction phase	NA *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ Double layer silt curtains to enclose WSRs C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of construction; and		For C7a, I For C8, N/A *(The requirement of silt curtain / screen has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ The silt curtains and silt screens should be regularly checked and maintained.		I
			<u>Specific Measures to be Applied to Land Formation Activities during Marine Filling Works</u> ▪ Double layer 'Type II' or 'Type III' silt curtains to be applied around the eastern openings between partially completed seawalls prior to commencement of marine filling activities. The silt curtains shall be configured to minimise SS release during ebb tides;	Within construction site / Duration of the construction phase	N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ Double layer silt curtains to be applied at the south-western opening prior to commencement of marine filling activities;		N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ Double layer silt curtain to enclose WSR C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of marine filling activities; and		N/A *(The requirement of silt curtain / screen has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ The silt curtains and silt screens should be regularly checked and maintained.		N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Specific Measures to be Applied to the Field Joint Excavation Works for the Submarine Cable Diversion ▪ Only closed grabs designed and maintained to avoid spillage shall be used and should seal tightly when operated. Excavated materials shall be disposed at designated marine disposal area in accordance with the Dumping and Sea Ordinance (DASO) permit conditions; and ▪ Silt curtains surrounding the closed grab dredger to be deployed as a precautionary measure.	Within construction site / Duration of the construction phase	N/A
8.8.1.4	5.1	-	**Modification of the Existing Seawall** ▪ Silt curtains shall be deployed around the seawall modification activities to completely enclose the active works areas, and care should be taken to avoid splashing of rockfill / rock armour into the surrounding marine environment. For the connecting sections with the existing outfalls, works for these connection areas should be undertaken during the dry season in order that individual drainage culvert cells may be isolated for interconnection works.	At the existing northern seawall / Duration of the construction phase	N/A
8.8.1.5	5.1	-	**Construction of New Stormwater Outfalls and Modifications to Existing Outfalls** ▪ During operation of the temporary drainage channel, runoff control measures such as bunding or silt fence shall be provided on both sides of the channel to prevent accumulation and release of SS via the temporary channel. Measures should also be taken to minimise the ingress of site drainage into the culvert excavations.	Within construction site / Duration of the construction phase	N/A
8.8.1.6 8.8.1.7	5.1	2.27	**Piling Activities for Construction of New Runway Approach Lights and HKIAAA Marker Beacons** Silt curtains shall be deployed around the piling activities to completely enclose the piling works and care should be taken to avoid spillage of excavated materials into the surrounding marine environment. For construction of the eastern approach lights at the CMPs ▪ Ground improvement via DCM using a close-spaced layout shall be completed prior to commencement of piling works; ▪ Steel casings shall be installed to enclose the excavation area prior to commencement of excavation; ▪ The excavated materials shall be removed using a closed grab within the steel casings; ▪ No discharge of the cement mixed materials into the marine environment will be allowed; and ▪ Excavated materials shall be treated and reused on-site.	Within construction site / Duration of the construction phase	N/A
8.8.1.8	5.1	-	**Construction of Site Runoff and Drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended: ▪ Install perimeter cut-off drains to direct off-site water around the site and implement internal drainage, erosion and sedimentation control facilities. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site	Within construction site / Duration of the construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			drainage system should be undertaken by the Contractors prior to the commencement of construction (for works areas located on the existing Airport island) or as soon as the new land is completed (for works areas located on the new landform);		
			▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM-DSS standards under the WPCO. The design of efficient silt removal facilities should make reference to the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractors prior to the commencement of construction;		I
			▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly;		I
			▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities;		N/A
			▪ In the event that contaminated groundwater is identified at excavation areas, this should be treated on-site using a suitable wastewater treatment process. The effluent should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge to foul sewers or collected for proper disposal off-site. No direct discharge of contaminated groundwater is permitted; and		N/A
			▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exits. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. All washwater should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge.		I
8.8.1.9	5.1	-	**Sewage Effluent from Construction Workforce** ▪ Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	Within construction site / During construction phase	I
8.8.1.10 8.8.1.11	5.1		**General Construction Activities** ▪ Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used; and	Within construction site / During construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.		
8.8.1.12 8.8.1.13	5.1	2.28	**Drilling Activities for the Submarine Aviation Fuel Pipelines** To prevent potential water quality impacts at Sha Chau, the following measures shall be applied: ▪ A 'zero-discharge' policy shall be applied for all activities to be conducted at Sha Chau; ▪ No bulk storage of chemicals shall be permitted; and ▪ A containment pit shall be constructed around the drill holes. This containment pit shall be lined with impermeable lining and bunded on the outside to prevent inflow from off-site areas.	Within construction site / During construction phase	I
			At the airport island side of the drilling works, the following measures shall be applied for treatment of wastewater: ▪ During pipe cleaning, appropriate desilting or sedimentation device should be provided on site for treatment before discharge. The Contractor should ensure discharge water from the sedimentation tank meet the WPCO/TM requirements before discharge; and ▪ Drilling fluid used in drilling activities should be reconditioned and reused as far as possible. Temporary enclosed storage locations should be provided on-site for any unused chemicals that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.	Within construction site / During construction phase	I
			Waste Management Implication – Construction Phase		
10.5.1.1	7.1	-	Opportunities to minimise waste generation and maximise the reuse of waste materials generated by the project have been incorporated where possible into the planning, design and construction stages, and the following measures have been recommended: ▪ The relevant construction methods (particularly for the tunnel works) and construction programme have been carefully planned and developed to minimise the extent of excavation and to maximise the on-site reuse of inert C&D materials generated by the project as far as practicable. Temporary stockpiling areas will also be provided to facilitate on-site reuse of inert C&D materials;	Project Site Area / During design and construction phase	I
			▪ Priority should be given to collect and reuse suitable inert C&D materials generated from other concurrent projects and the Government's PFRF as fill materials for the proposed land formation works;		I
			▪ Only non-dredged ground improvement methods should be adopted in order to completely avoid the need for dredging and disposal of marine sediment for the proposed land formation work;		I
			▪ Excavation work for constructing the APM tunnels, BHS tunnels and airside tunnels will not be down to the CMPs beneath the fill materials in order to avoid excavating any sediments; and		N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ For the marine sediments expected to be excavated from the piling works of TRC, APM & BHS tunnels, airside tunnels and other facilities on the proposed land formation area, piling work of marine sections of the approach lights and HKIAAA beacons, basement works for some of T2 expansion area and excavation works for the proposed APM depot should be treated and reused on-site as backfilling materials, although required treatment level / detail and the specific re-use mode are under development.		N/A
10.5.1.1	7.1	-	The following good site practices should be performed during the construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; ▪ Training of site personnel in proper waste management and chemical waste handling procedures; ▪ Provision of sufficient waste disposal points and regular collection for disposal; ▪ Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks by tarpaulin/ similar material or by transporting wastes in enclosed containers. The cover should be extended over the edges of the sides and tailboards; ▪ Stockpiles of C&D materials should be kept wet or covered by impervious sheets to avoid wind-blown dust; ▪ All dusty materials including C&D materials should be sprayed with water immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling at the barging points/ stockpile areas; ▪ C&D materials to be delivered to and from the project site by barges or by trucks should be kept wet or covered to avoid wind-blown dust; ▪ The speed of the trucks including dump trucks carrying C&D or waste materials within the site should be controlled to about 10 km/hour in order to reduce the adverse dust impact and secure the safe movement around the site; and ▪ To avoid or minimise dust emission during transport of C&D or waste materials within the site, each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials. Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.	Project Site Area / Construction Phase	I
10.5.1.3	7.1	-	The following practices should be performed to achieve waste reduction include: ▪ Use of steel or aluminium formworks and falseworks for temporary works as far as practicable; ▪ Adoption of repetitive design to allow reuse of formworks as far as practicable; ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;	Project Site Area / Construction Phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force; ▪ Any unused chemicals or those with remaining functional capacity should be collected for reused as far as practicable; ▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and ▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.		
10.5.1.5	7.1		▪ Inert and non-inert C&D materials should be handled and stored separately to avoid mixing the two types of materials.	Project Site Area / Construction Phase	I
10.5.1.5	7.1	-	▪ Any recyclable materials should be segregated from the non-inert C&D materials for collection by reputable licensed recyclers whereas the non-recyclable waste materials should be disposed of at the designated landfill site by a reputable licensed waste collector.	Project Site Area / Construction Phase	I
10.5.1.6	7.1	-	▪ A trip-ticket system promulgated shall be developed in order to monitor the off-site delivery of surplus inert C&D materials that could not be reused on-site for the proposed land formation work at the PFRF and to control fly tipping.	Project Site Area / Construction Phase	I
10.5.1.6	7.1	2.32	▪ The Contractor should prepare and implement a Waste Management Plan detailing various waste arising and waste management practices.	Construction Phase	I
10.5.1.16	7.1	-	The following mitigation measures are recommended during excavation and treatment of the sediments: ▪ On-site remediation should be carried out in an enclosed area in order to minimise odour/dust emissions; ▪ The loading, unloading, handling, transfer or storage of treated and untreated sediment should be carried out in such a manner to prevent or minimise dust emissions; ▪ All practical measures, including but not limited to speed control for vehicles, should be taken to minimise dust emission; ▪ Good housekeeping should be maintained at all times at the sediment treatment facility and storage area; ▪ Treated and untreated sediment should be clearly separated and stored separately; and ▪ Surface runoff from the enclosed area should be properly collected and stored separately, and then properly treated to levels in compliance with the relevant effluent standards as required by the Water Pollution Control Ordinance before final discharge.	Project Site Area / Construction Phase	N/A
10.5.1.18	7.1	-	The marine sediments to be removed from the cable field joint area would be disposed of at the designated disposal sites to be allocated by the MFC. The following mitigation measures should be strictly	Project Site Area / Construction Phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			followed to minimise potential impacts on water quality during transportation of the sediments requiring Type 1 disposal: ▪ Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material; ▪ Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by EPD; and ▪ Barges or hopper barges shall not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation.		
10.5.1.19	7.1	-	Contractor should register with the EPD as a chemical waste producer and to follow the relevant guidelines. The following measures should be implemented: ▪ Good quality containers compatible with the chemical wastes should be used; ▪ Incompatible chemicals should be stored separately; ▪ Appropriate labels must be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc.; and ▪ The contractor will use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	Project Site Area / Construction Phase	I
10.5.1.20	7.1	-	▪ General refuse should be stored in enclosed bins or compaction units separated from inert C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site for disposal at designated landfill sites. An enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	Project Site Area / Construction Phase	I
10.5.1.21	7.1	-	▪ The construction contractors will be required to regularly check and clean any refuse trapped or accumulated along the newly constructed seawall. Such refuse will then be stored and disposed of together with the general refuse.	Project Site Area / Construction Phase	N/A
			Land Contamination – Construction Phase		
11.10.1.2 to 11.10.1.3	8.1	2.32	For areas inaccessible during site reconnaissance survey ▪ Further site reconnaissance would be conducted once the areas are accessible in order to identify any land contamination concern for the areas.	Project Site Area inaccessible during site reconnaissance / Prior to Construction Phase	I
			▪ Subject to further site reconnaissance findings, a supplementary Contamination Assessment Plan (CAP) for additional site investigation (SI) (if necessary) may be prepared and submitted to EPD for endorsement prior to the commencement of SI at these areas.		I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ After completion of SI, the Contamination Assessment Report (CAR) will be prepared and submitted to EPD for approval prior to start of the proposed construction works at the golf course, the underground and above-ground fuel storage tank areas, emergency power generation units, airside petrol filling station and fuel tank room.		I *(CAR for golf course)
			▪ Should remediation be required, Remediation Action Plan (RAP) and Remediation Report (RR) will be prepared for EPD's approval prior to commencement of the proposed remediation and any construction works respectively.		N/A
11.8.1.2	8.1	-	If contaminated soil is identified, the following mitigation measures are for the excavation and transportation of contaminated materials (if any): ▪ To minimize the incidents of construction workers coming in contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; ▪ Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when working directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; ▪ Stockpiling of contaminated excavated materials on site should be avoided as far as possible; ▪ The use of any contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; ▪ Vehicles containing any excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; ▪ Truck bodies and tailgates should be sealed to prevent any discharge; ▪ Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; ▪ Speed control for trucks carrying contaminated materials should be exercised. 8km/h is the recommended speed limit; ▪ Strictly observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and obtain all necessary permits where required; and ▪ Maintain records of waste generation and disposal quantities and disposal arrangements.	Project Site Area / Construction Phase	N/A
			Terrestrial Ecological – Construction Phase		
12.10.1.1	9.2	2.14	**Pre-construction Egretry Survey** ▪ Conduct ecological survey for Sha Chau egretry to update the latest boundary of the egretry.	Breeding season (April - July) prior to commencement of HDD drilling works at HKIA	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
12.7.2.3 and 12.7.2.6	9.1	2.30	**Avoidance and Minimisation of Direct Impact to Egretry** ▪ The daylighting location will avoid direct encroachment to the Sheung Sha Chau egretry. The daylighting location and mooring of flat top barge, if required, will be kept away from the egretry; ▪ In any event, controls such as demarcation of construction site boundary and confining the lighting within the site will be practised to minimise disturbance to off-site habitat at Sheung Sha Chau Island; and ▪ The containment pit at the daylighting location shall be covered or camouflaged.	During construction phase at Sheung Sha Chau Island	I
12.7.2.5	9.1	2.30	**Preservation of Nesting Vegetation** ▪ The proposed daylighting location and the arrangement of connecting pipeline will avoid the need of tree cutting, therefore the trees that are used by ardeids for nesting will be preserved.	During construction phase at Sheung Sha Chau Island	I
12.7.2.4 and 12.7.2.6	9.1	2.30	**Timing the Pipe Connection Works outside Ardeid's Breeding Season** ▪ All HDD and related construction works on Sheung Sha Chau Island will be scheduled outside the ardeids' breeding season (between April and July). No night-time construction work will be allowed on Sheung Sha Chau Island during all seasons.	During construction phase at Sheung Sha Chau Island	I
12.10.1.1	9.3	-	**Ecological Monitoring** ▪ During the HDD construction works period from August to March, ecological monitoring will be undertaken monthly at the HDD daylighting location on Sheung Sha Chau Island to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found.	at Sheung Sha Chau Island	I
			Marine Ecological Impact – Pre-construction Phase		
13.11.4.1	10.2.2	-	▪ Pre-construction phase Coral Dive Survey.	HKIAAA artificial seawall	I
			Marine Ecological Impact – Construction Phase		
13.11.1.3 to 13.11.1.6	-	-	**Minimisation of Land Formation Area** ▪ Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for marine resources, especially the CWD population.	Land formation footprint / during detailed design phase to completion of construction	I
13.11.1.7 to 13.11.1.10	-	2.31	**Use of Construction Methods with Minimal Risk/Disturbance** ▪ Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF;	During construction phase at marine works area	I
			▪ Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on CWDs, fisheries and the marine environment;		I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway;		N/A
			▪ Avoid bored piling during CWD peak calving season (Mar to Jun);		I
			▪ Prohibition of underwater percussive piling; and		I
			▪ Use of horizontal directional drilling (HDD) method and water jetting methods for placement of submarine cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources.		I
13.11.2.1 to 13.11.2.7	-	-	**Mitigation for Indirect Disturbance due to Deterioration of Water Quality** ▪ Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices;	All works area during the construction phase	I
			▪ Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains);		I
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and		N/A
			Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources.		I
13.11.1.12	-	-	**Strict Enforcement of No-Dumping Policy** ▪ A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to dolphins and/or their habitat in the work area; ▪ Mandatory educational programme of the no-dumpling policy be made available to all construction site personnel for all project-related works; ▪ Fines for infractions should be implemented; and ▪ Unscheduled, on-site audits shall be implemented.	All works area during the construction phase	I
13.11.1.13	-	-	**Good Construction Site Practices** ▪ Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines; ▪ Keep the number of working or stationary vessels present on-site to the minimum anytime; and ▪ Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators.	All works area during the construction phase	I
13.11.1.3 to 13.11.1.6	-	-	**Minimisation of Land Formation Area** ▪ Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for marine resources, especially the CWD population.	Land formation footprint / during detailed design phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
				to completion of construction	
13.11.5.4 to 13.11.5.13	10.3.1	-	**SkyPier High Speed Ferries' Speed Restrictions and Route Diversions** ▪ SkyPier HSFs operating to / from Zhuhai and Macau would divert north of SCLKC Marine Park with a 15 knot speed limit to apply for the part-journeys that cross high CWD abundance grid squares as indicatively shown in **Drawing No. MCL/P132/EIA/13-023** of the EIA Report. Both the alignment of the northerly route and the portion of routings to be subject to the speed limit of 15 knots shall be finalised prior to commencement of construction based on the future review of up-to-date CWD abundance and EM&A data and taking reference to changes in total SkyPier HSF numbers; and ▪ A maximum of 10 knots will be enforced through the designated SCLKC Marine Park area at all times.	Area between the footprint and SCLKC Marine Park during construction phase	I
			Other mitigation measures ▪ The ET will audit various parameters including actual daily numbers of HSFs, compliance with the 15-knot speed limit in the speed control zone and diversion compliance for SkyPier HSFs operating to / from Zhuhai and Macau; and ▪ The effectiveness of the CWD mitigation measures after implementation of initial six month SkyPier HSF diversion and speed restriction will be reviewed.	Area between the footprint and SCLKC Marine Park during construction phase	I
13.11.5.14 to 13.11.5.18	10.3.1	2.31	**Dolphin Exclusion Zone** ▪ Establishment of a 24 hr Dolphin Exclusion Zone (DEZ) with a 250 m radius around the land formation works areas;	Marine waters around land formation works area during construction phase	I
			▪ A DEZ would also be implemented during ground improvement works (e.g. DCM), water jetting works for submarine cables diversion, open trench dredging at the field joint locations and seawall construction; and		I
			▪ A DEZ would also be implemented during bored piling work but as a precautionary measure only.		N/A
13.11.5.19	10.4	2.31	**Acoustic Decoupling of Construction Equipment** ▪ Air compressors and other noisy equipment that must be mounted on steel barges should be acoustically-decoupled to the greatest extent feasible, for instance by using rubber or air-filled tyres; and ▪ Specific acoustic decoupling measures shall be specified during the detailed design of the project for use during the land formation works.	Around coastal works area during construction phase	I
13.11.5.20	10.6.1	2.29	**Spill Response Plan** ▪ An oil and hazardous chemical spill response plan is proposed to be established during the construction phase as a precautionary measure so that appropriate actions to prevent or reduce risks to CWDs can be undertaken in the event of an accidental spillage.	Construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
13.11.5.21 to 13.11.5.23	10.6.1	-	**Construction Vessel Speed Limits and Skipper Training** ▪ A speed limit of 10 knots should be strictly observed for construction vessels at areas with the highest CWD densities; and ▪ Vessels traversing through the work areas should be required to use predefined and regular routes (which would presumably become known to resident dolphins) to reduce disturbance to cetaceans due to vessel movements. Specific marine routes shall be specified by the Contractor prior to construction commencing.	All areas north and west of Lantau Island during construction phase	I
			Fisheries Impact – Construction Phase		
14.9.1.2 to 14.9.1.5	-		**Minimisation of Land Formation Area** ▪ Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for fisheries resources.	Land formation footprint / during detailed design phase to completion of construction	I
14.9.1.6	-	-	**Use of Construction Methods with Minimal Risk/Disturbance** ▪ Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF;	During construction phase at marine works area	I
			▪ Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on fisheries and the marine environment;		I
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and		N/A
			▪ Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources.		I
14.9.1.11	-		**Strict Enforcement of No-Dumping Policy** ▪ A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to dolphins and/or their habitat in the work area; ▪ Mandatory educational programme of the no-dumpling policy be made available to all construction site personnel for all project-related works; ▪ Fines for infractions should be implemented; and ▪ Unscheduled, on-site audits shall be implemented.	All works area during the construction phase	I
14.9.1.12	-		**Good Construction Site Practices** ▪ Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines; ▪ Keep the number of working or stationary vessels present on-site to the minimum anytime; and	All works area during the construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators.		
14.9.1.13 to 14.9.1.18	-		**Mitigation for Indirect Disturbance due to Deterioration of Water Quality** ▪ Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices;	All works area during the construction phase	I
			▪ Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains);		I
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and		N/A
			▪ Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources.		I
			Landscape and Visual Impact – Construction Phase		
Table 15.6	12.3	-	**CM1 -** The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM2 -** Reduction of construction period to practical minimum.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM3 -** Phasing of the construction stage to reduce visual impacts during the construction phase.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM4 -** Construction traffic (land and sea) including construction plants, construction vessels and barges should be kept to a practical minimum.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM5 -** Erection of decorative mesh screens or construction hoardings around works areas in visually unobtrusive colours.	All works areas for duration of works; Upon handover and completion of works. –	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
				may be disassembled in phases	
Table 15.6	12.3	-	**CM6 -** Avoidance of excessive height and bulk of site buildings and structures.	New passenger concourse, terminal 2 expansion and other proposed airport related buildings and structures under the project; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	**CM7** - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	All works areas for duration of works; Upon handover and completion of works. – may be disassembled in phases	I
Table 15.6	12.3	-	**CM8 -** All existing trees shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas.	All existing trees to be retained; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM9 -** Trees unavoidably affected by the works shall be transplanted where practical. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme.	All existing trees to be affected by the works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM10 -** Land formation works shall be followed with advanced hydroseeding around taxiways and runways as soon as practical.	All affected existing grass areas around runways and verges/Duration of works; Upon handover and completion of works.	N/A
			Cultural Heritage Impact – Construction Phase		
			Not applicable.		

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Health Impact – Aircraft Emissions		
			Not applicable.		
			Health Impact – Aircraft Noise		
			Not applicable.		

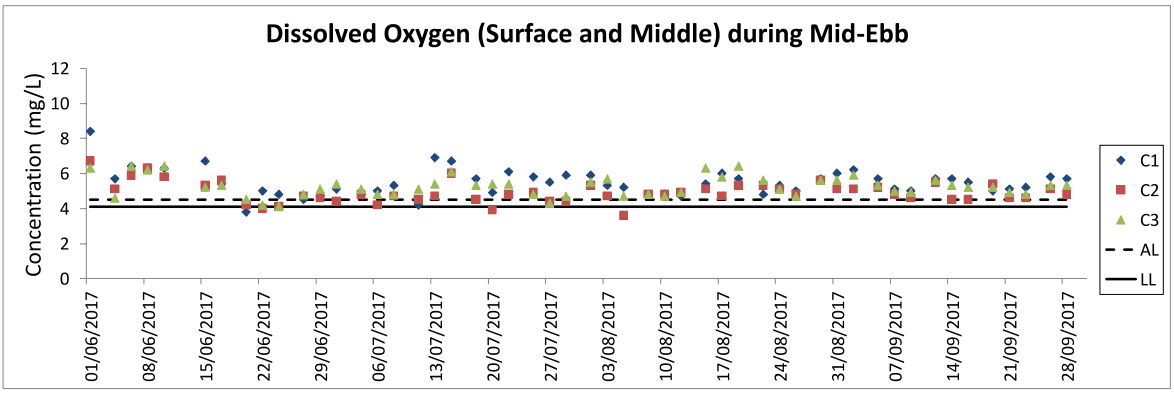
Notes:

I= implemented where applicable;

N/A= not applicable to the construction works implemented during the reporting month.

^ Checked by ET through site inspection and record provided by the Contractor.

Appendix C. Graphical Plots of Water Quality Monitoring Result


Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
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2
4
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8
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12
01/06/2017
08/06/2017
15/06/2017
22/06/2017
29/06/2017
06/07/2017
13/07/2017
20/07/2017
27/07/2017
03/08/2017
10/08/2017
17/08/2017
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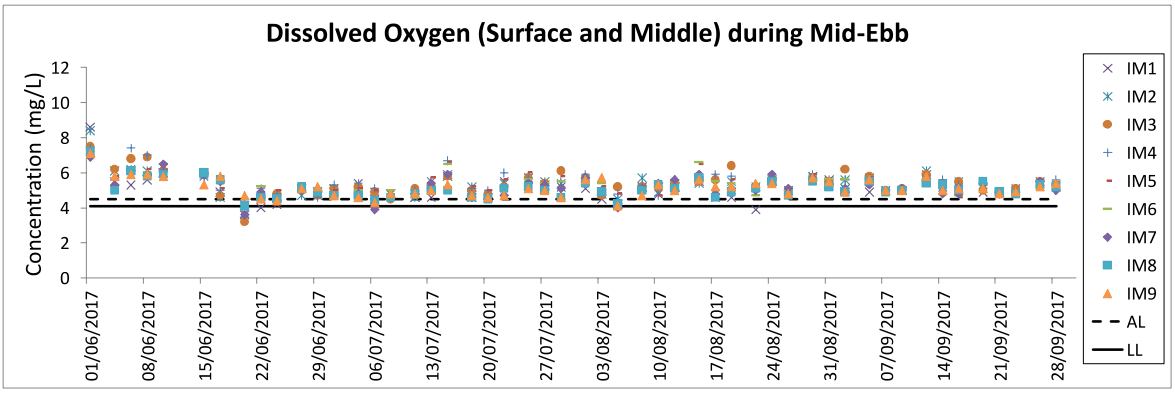
Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
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01/06/2017
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22/06/2017
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06/07/2017
13/07/2017
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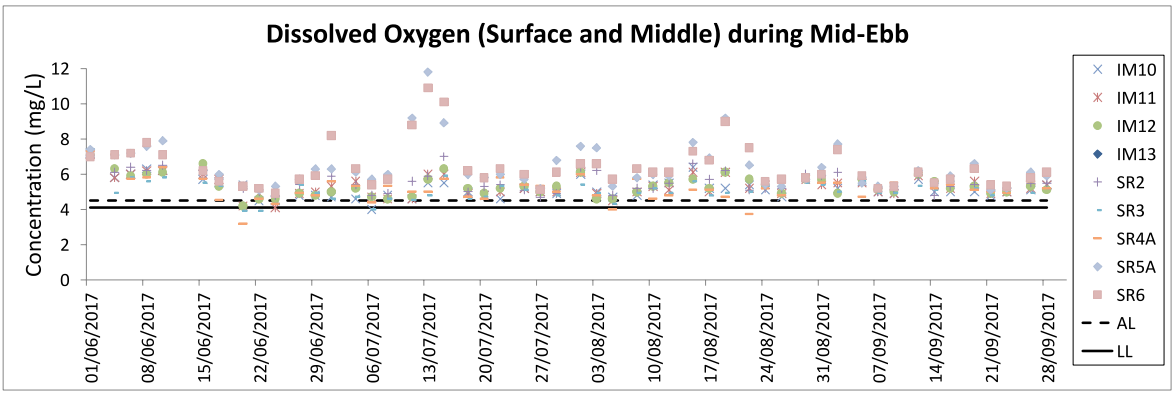
Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
0
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15/06/2017
22/06/2017
29/06/2017
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20/07/2017
27/07/2017
03/08/2017
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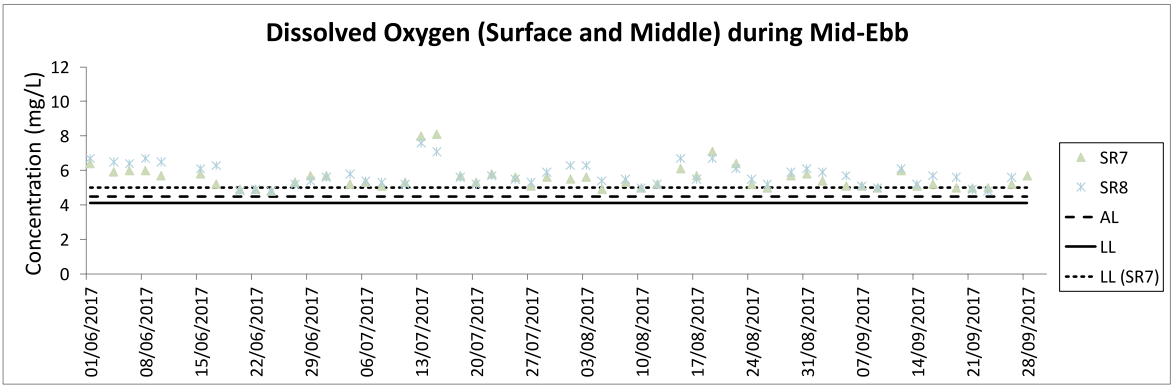
Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
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15/06/2017
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29/06/2017
06/07/2017
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20/07/2017
27/07/2017
03/08/2017
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SR7
SR8
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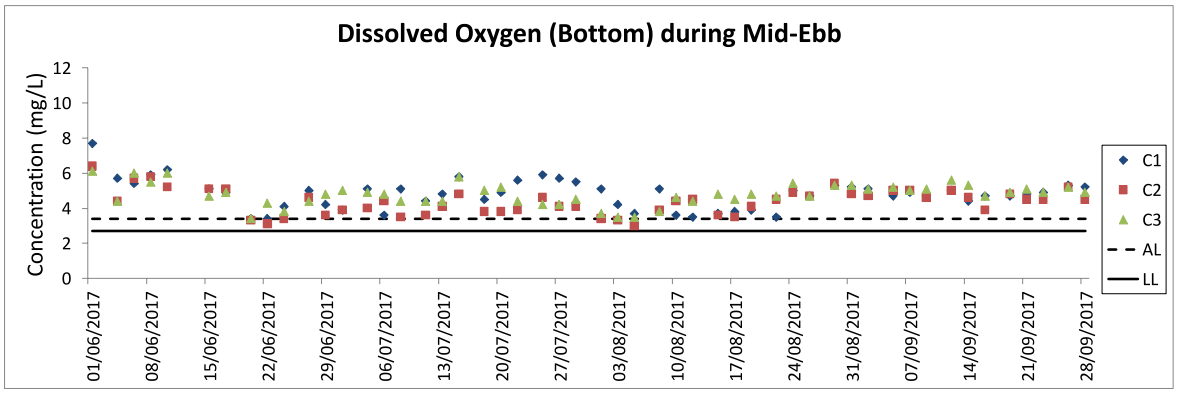
LL (SR7)


Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
0
2
4
6
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10
12
01/06/2017
08/06/2017
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22/06/2017
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06/07/2017
13/07/2017
20/07/2017
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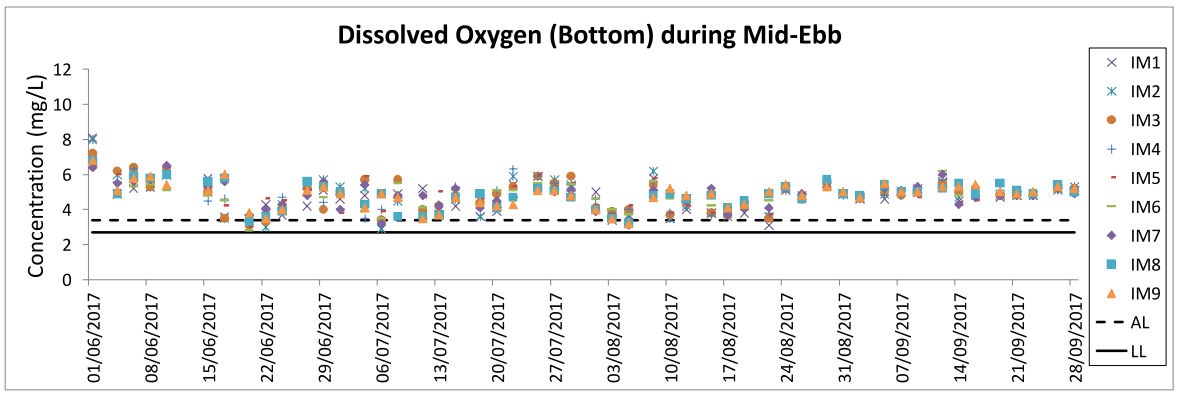
Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
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01/06/2017
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22/06/2017
29/06/2017
06/07/2017
13/07/2017
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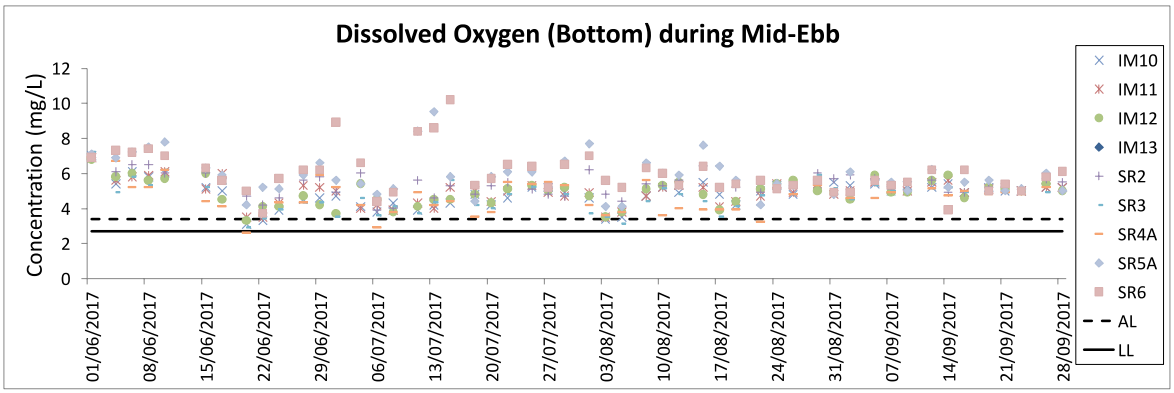
Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
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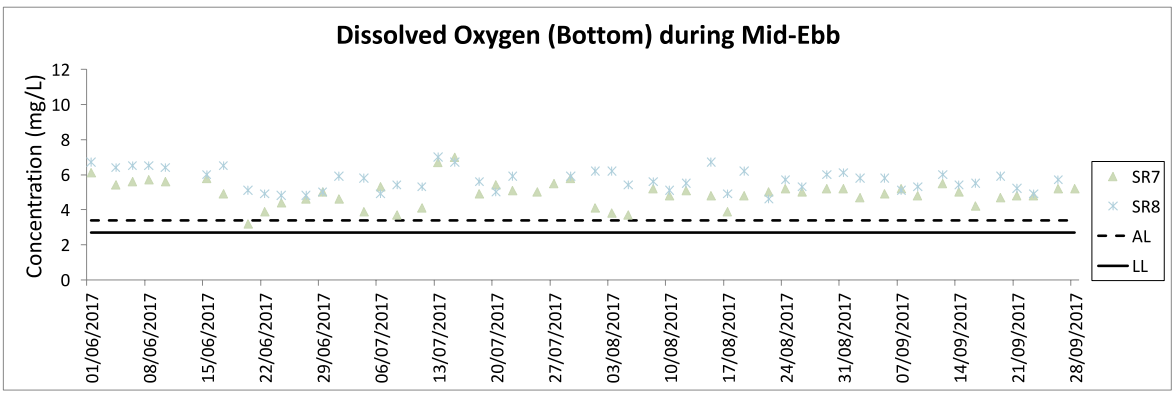
Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
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SR7
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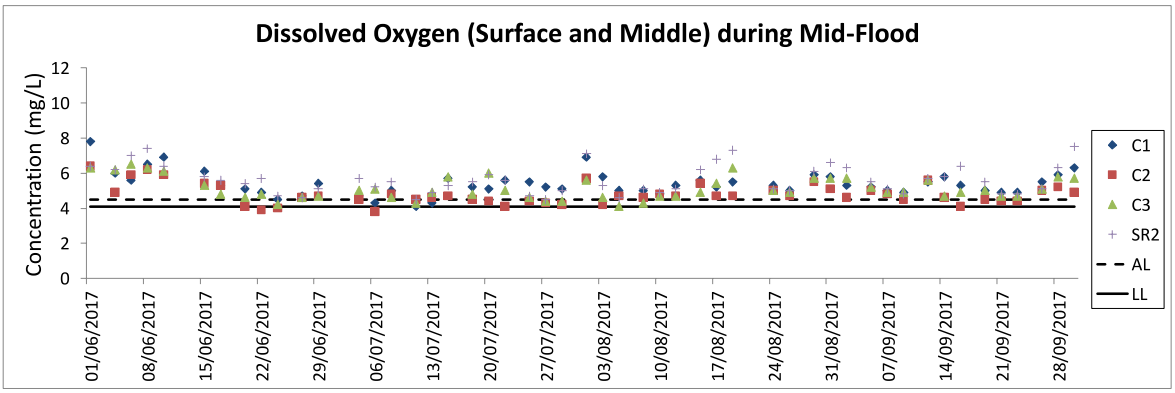
Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
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01/06/2017
08/06/2017
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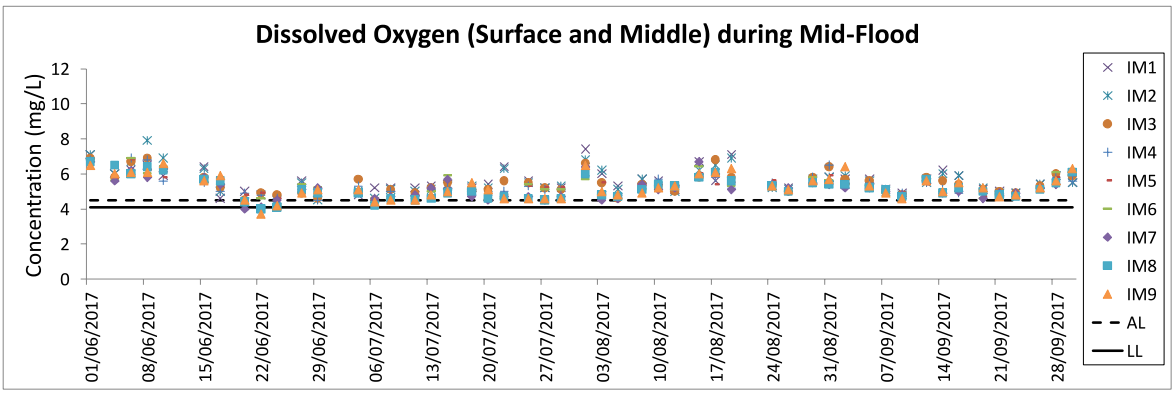
Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
0
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01/06/2017
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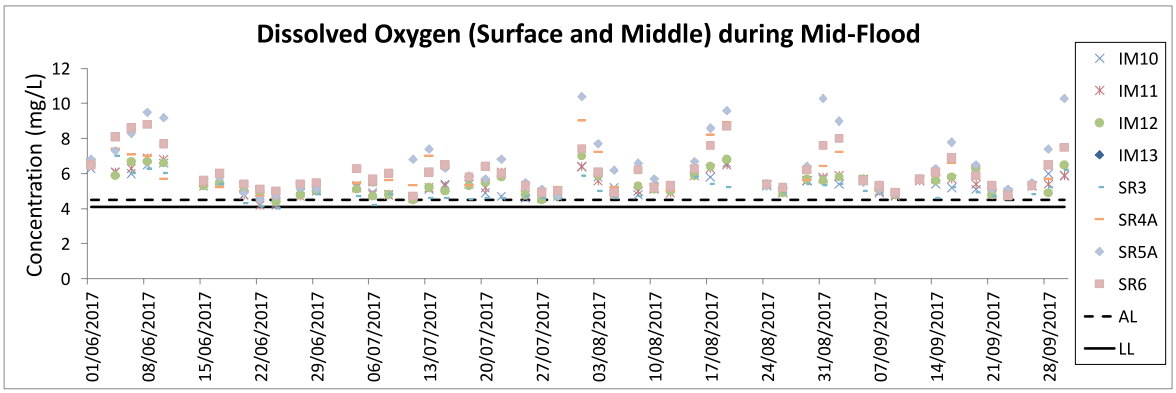
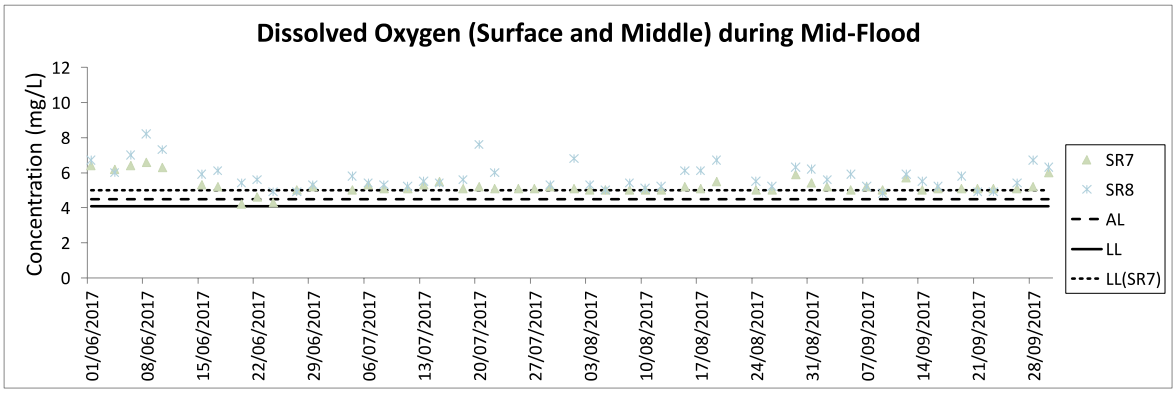

Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
0
2
4
6
8
10
12
01/06/2017
08/06/2017
15/06/2017
22/06/2017
29/06/2017
06/07/2017
13/07/2017
20/07/2017
27/07/2017
03/08/2017
10/08/2017
17/08/2017
24/08/2017
31/08/2017
07/09/2017
14/09/2017
21/09/2017
28/09/2017
IM10
IM11
IM12
IM13
SR3
SR4A
SR5A
SR6
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
0
2
4
6
8
10
12
01/06/2017
08/06/2017
15/06/2017
22/06/2017
29/06/2017
06/07/2017
13/07/2017
20/07/2017
27/07/2017
03/08/2017
10/08/2017
17/08/2017
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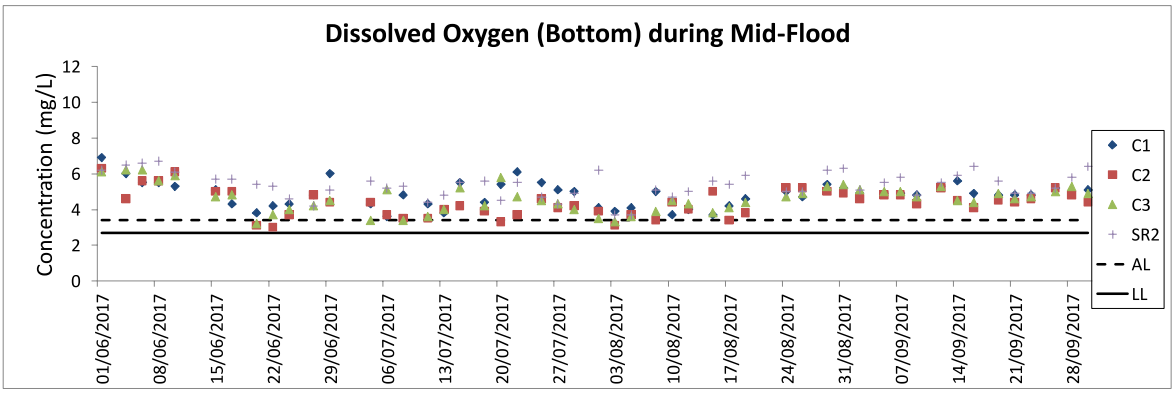
28/09/2017
SR7
SR8
AL
LL
LL(SR7)


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
0
2
4
6
8
10
12
01/06/2017
08/06/2017
15/06/2017
22/06/2017
29/06/2017
06/07/2017
13/07/2017
20/07/2017
27/07/2017
03/08/2017
10/08/2017
17/08/2017
24/08/2017
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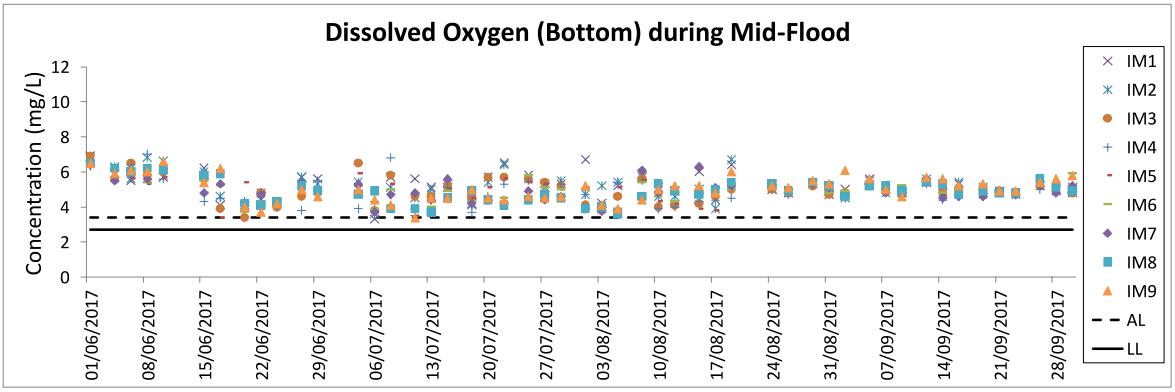
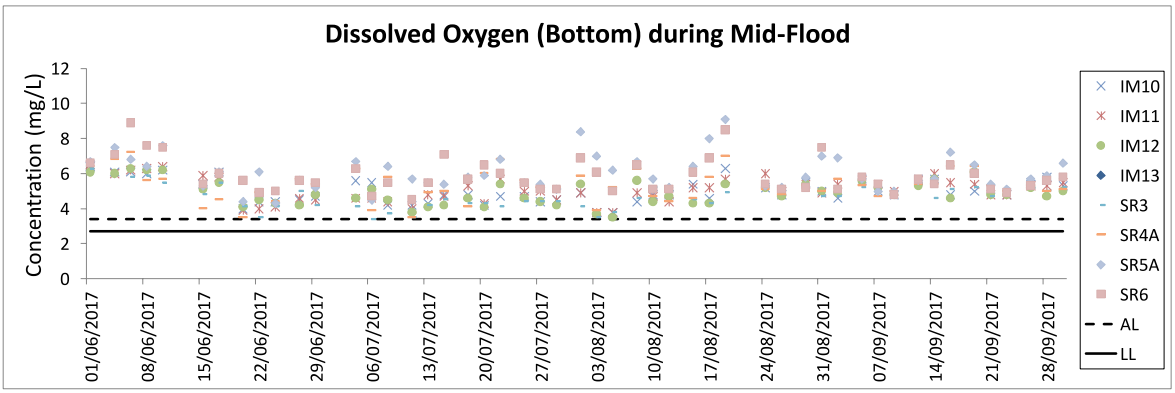
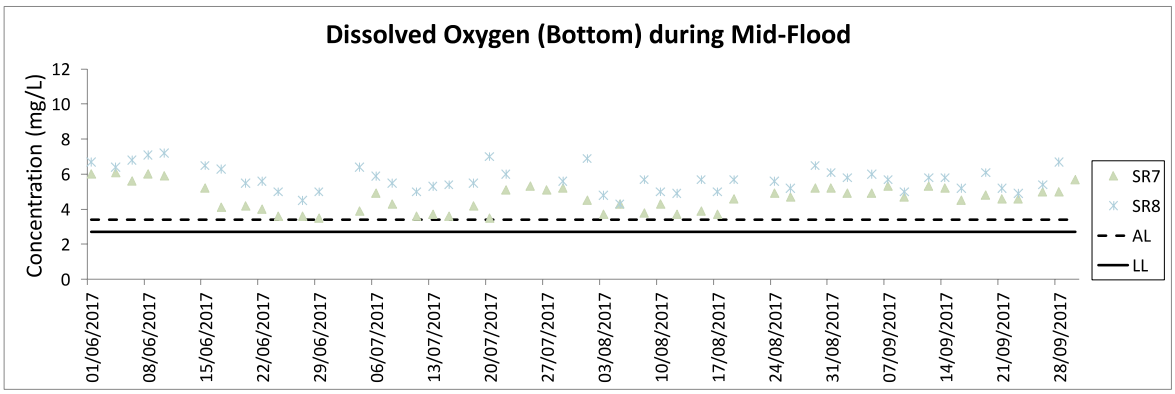
28/09/2017
C1
C2
C3
SR2
AL
LL


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
0
2
4
6
8
10
12
01/06/2017
08/06/2017
15/06/2017
22/06/2017
29/06/2017
06/07/2017
13/07/2017
20/07/2017
27/07/2017
03/08/2017
10/08/2017
17/08/2017
24/08/2017
31/08/2017
07/09/2017
14/09/2017
21/09/2017
28/09/2017
IM1
IM2
IM3
IM4
IM5
IM6
IM7
IM8
IM9
AL
LL


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
0
2
4
6
8
10
12
01/06/2017
08/06/2017
15/06/2017
22/06/2017
29/06/2017
06/07/2017
13/07/2017
20/07/2017
27/07/2017
03/08/2017
10/08/2017
17/08/2017
24/08/2017
31/08/2017
07/09/2017
14/09/2017
21/09/2017
28/09/2017
IM10
IM11
IM12
IM13
SR3
SR4A
SR5A
SR6
AL
LL


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
0
2
4
6
8
10
12
01/06/2017
08/06/2017
15/06/2017
22/06/2017
29/06/2017
06/07/2017
13/07/2017
20/07/2017
27/07/2017
03/08/2017
10/08/2017
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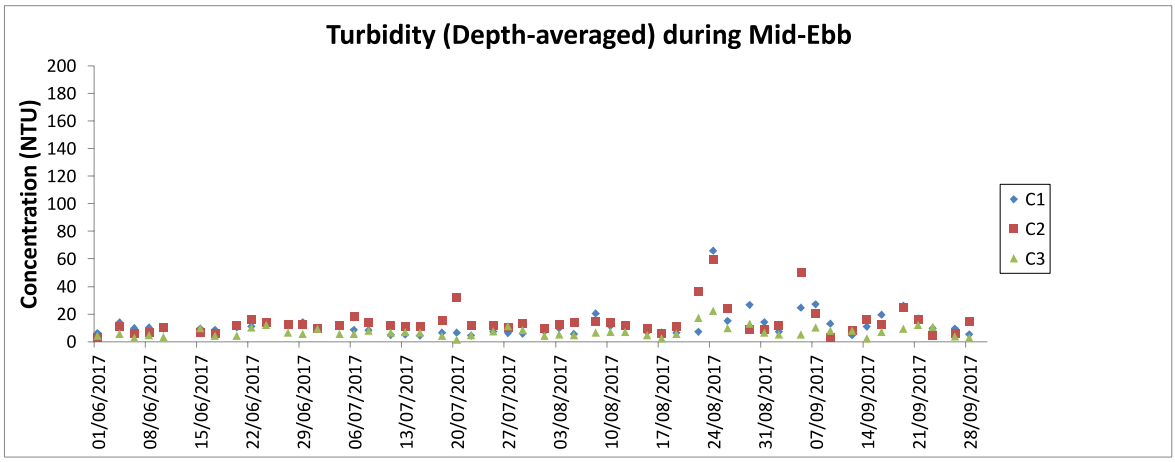
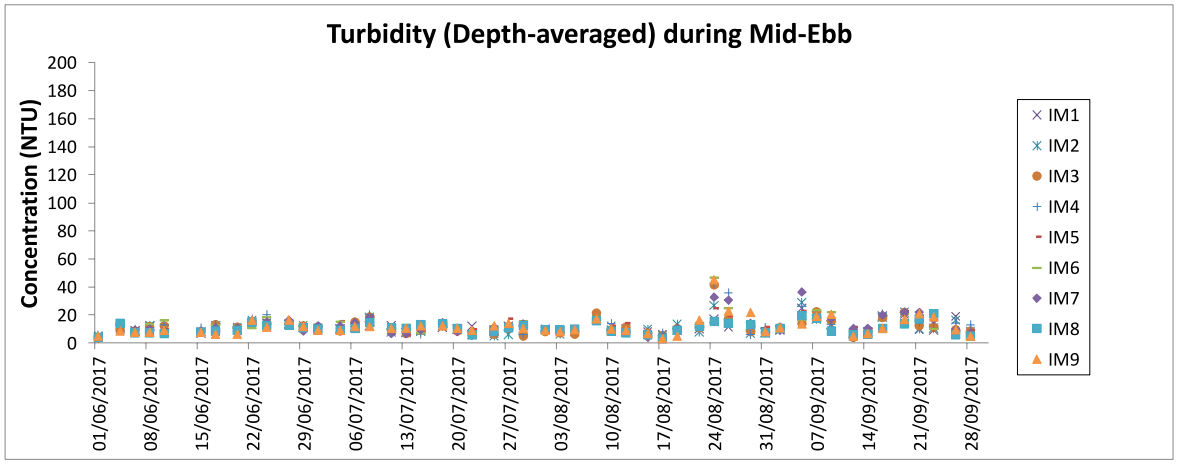
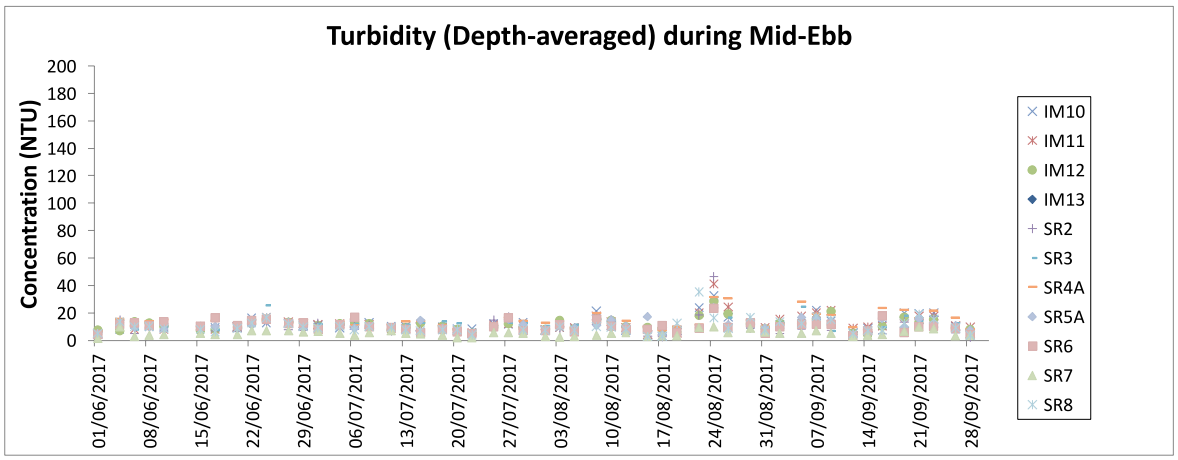
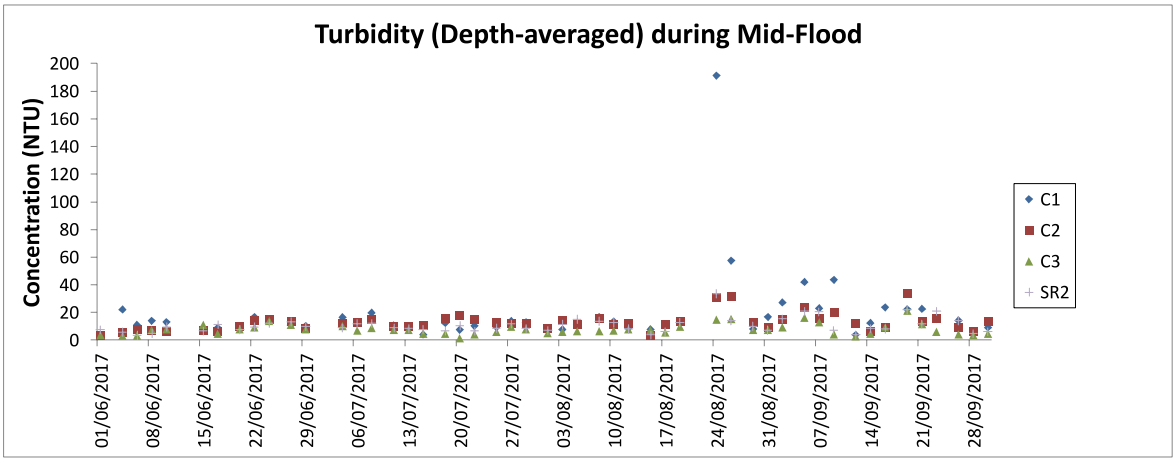
21/09/2017
28/09/2017
SR7
SR8
AL
LL

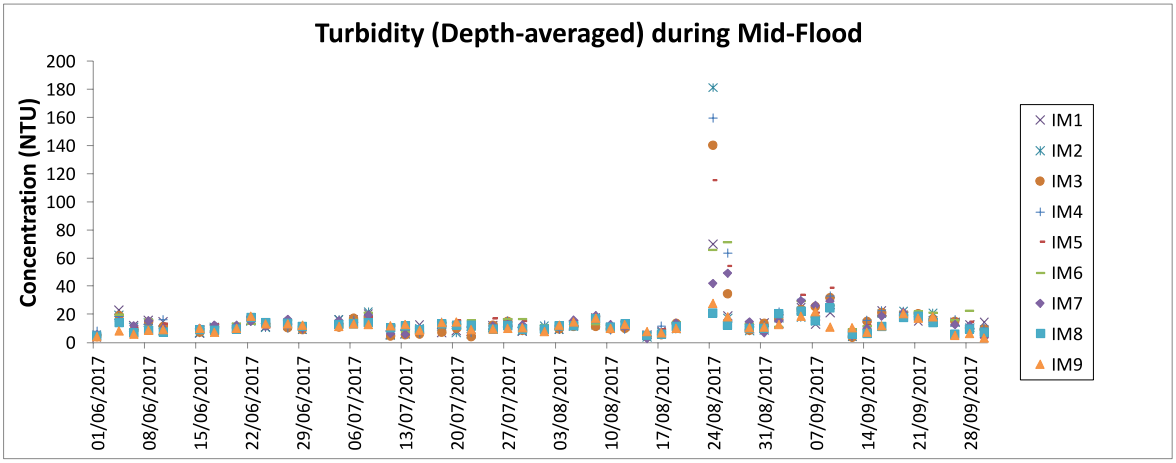


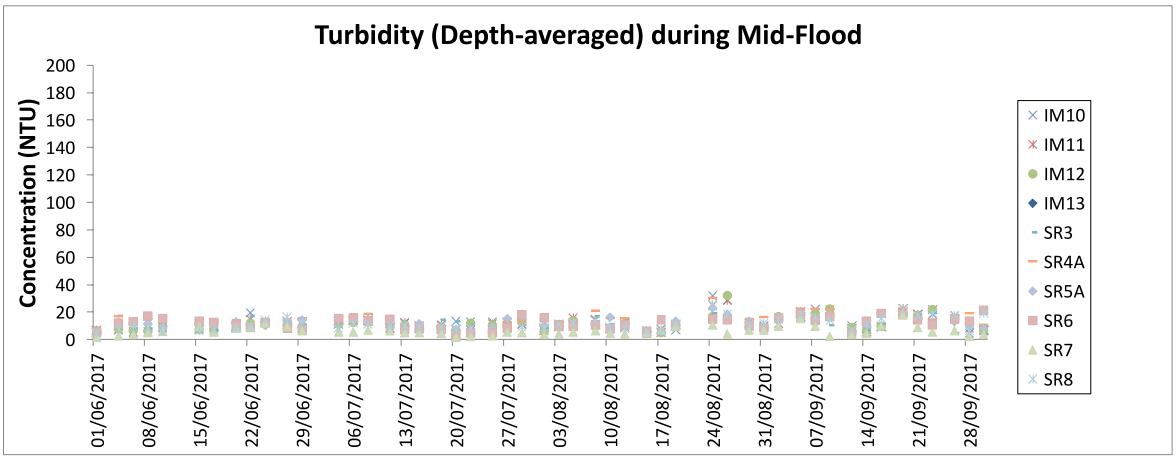




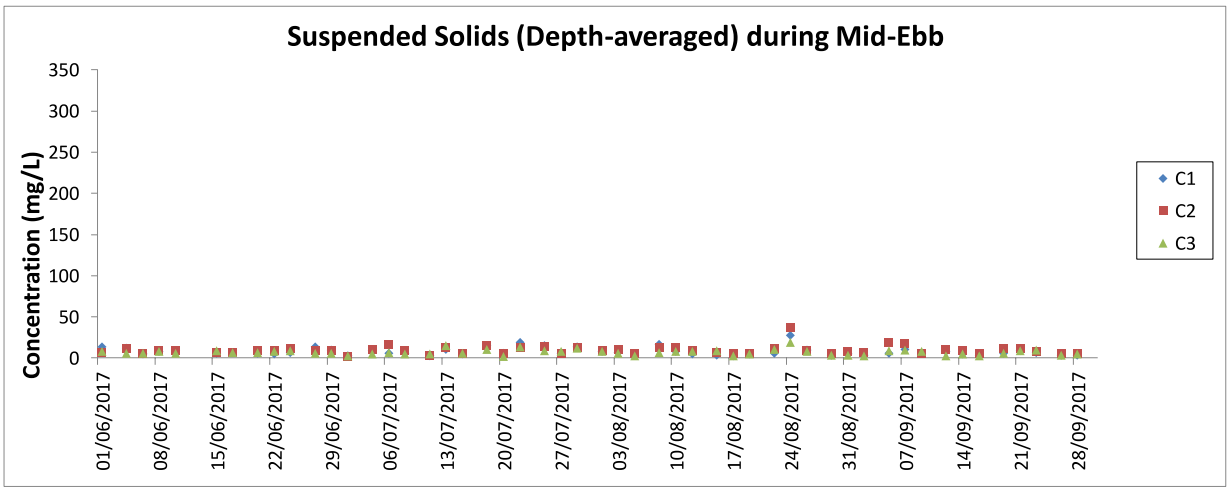
Note: The Action and Limit Levels of turbidity can be referred to Table 2.4 of the Quarterly EM&A Report.

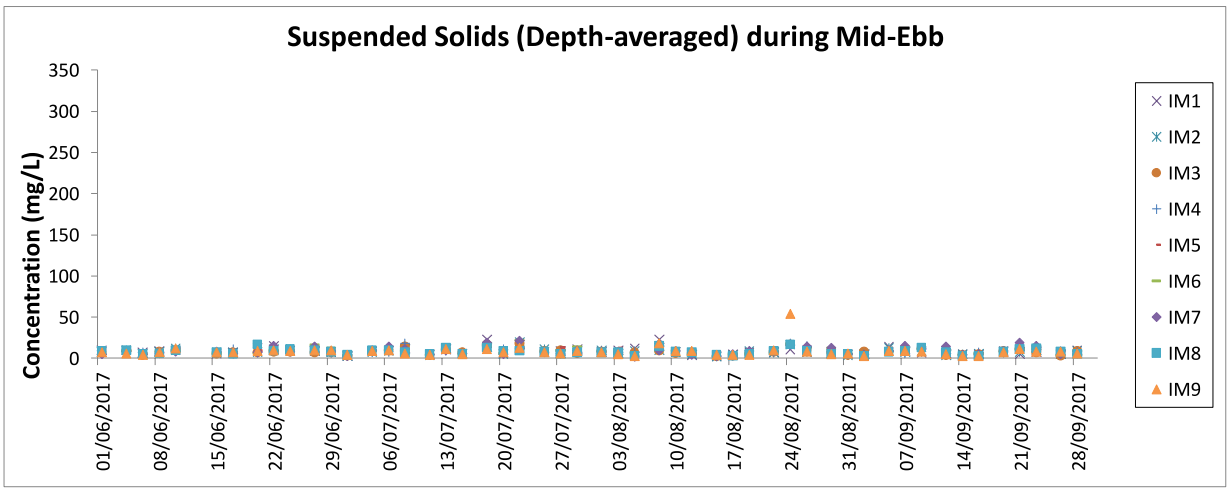


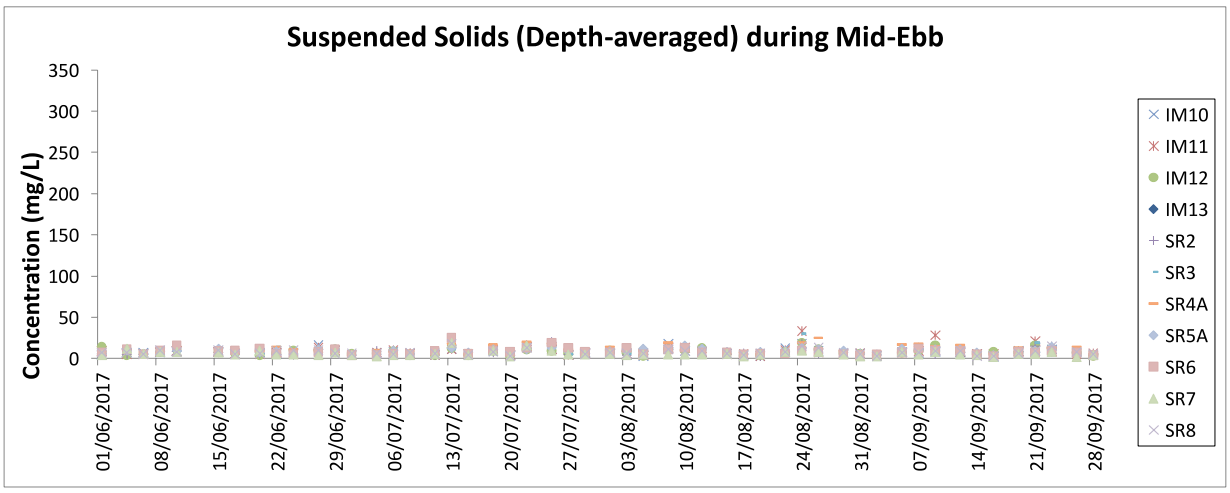




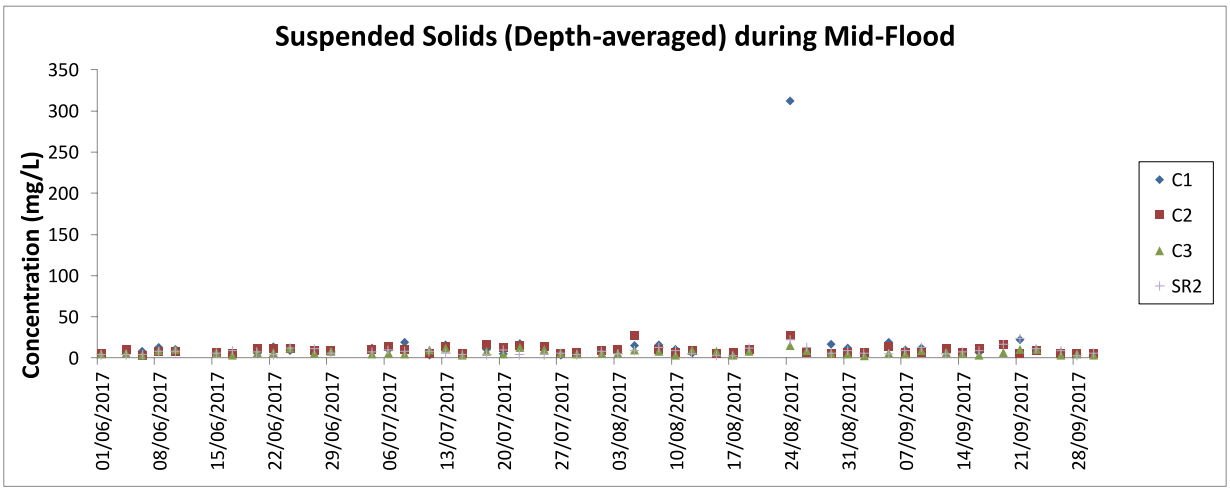
Note: The Action and Limit Levels of turbidity can be referred to Table 2.4 of the Quarterly EM&A Report.

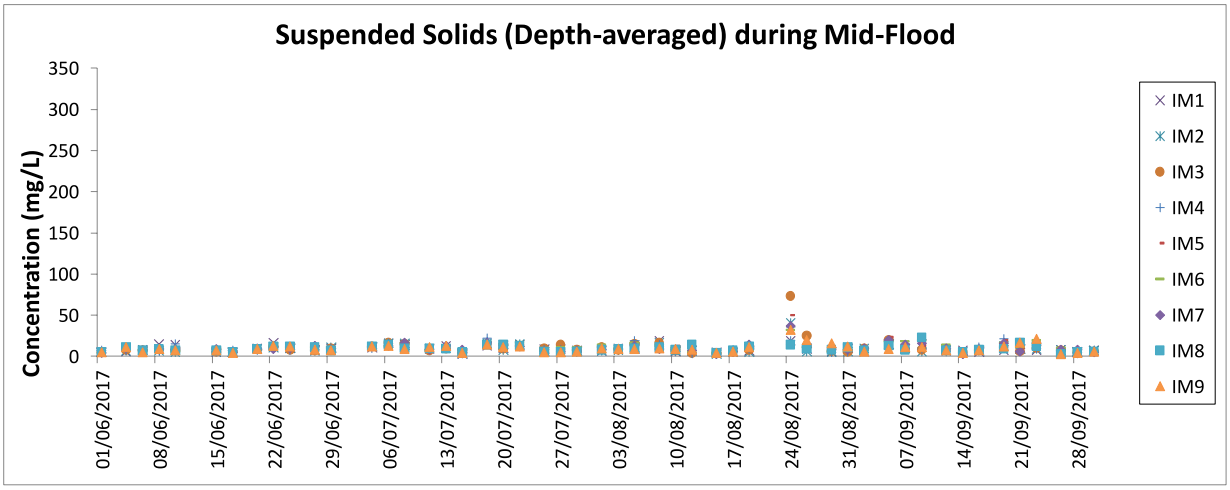


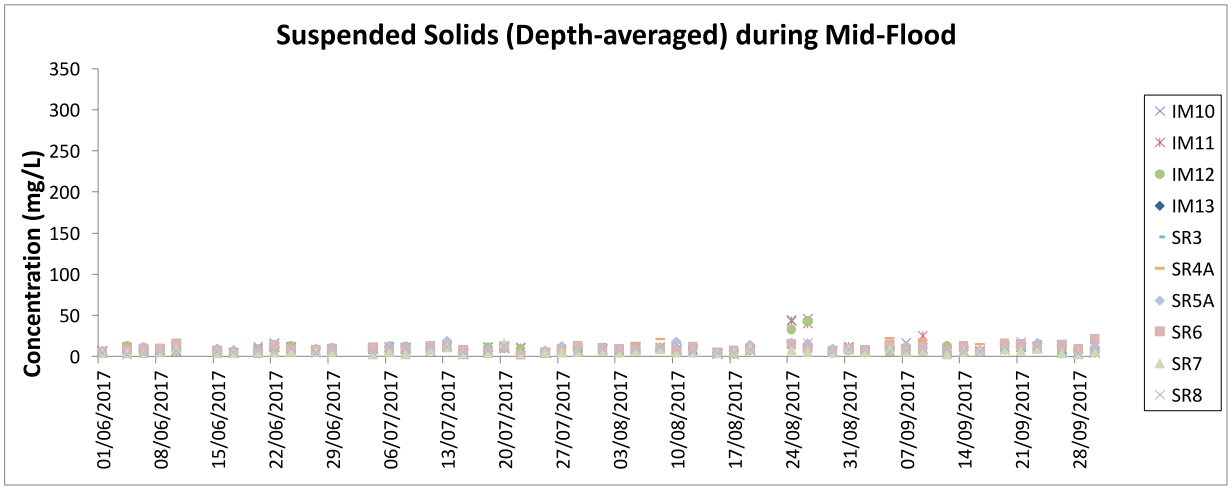




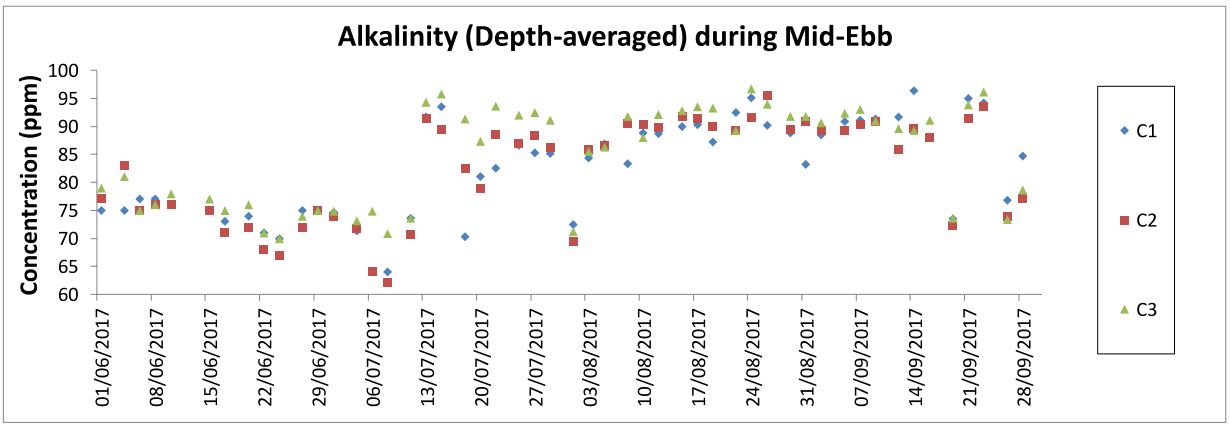
Note: The Action and Limit Levels of SS can be referred to Table 2.4 of the Quarterly EM&A Report.

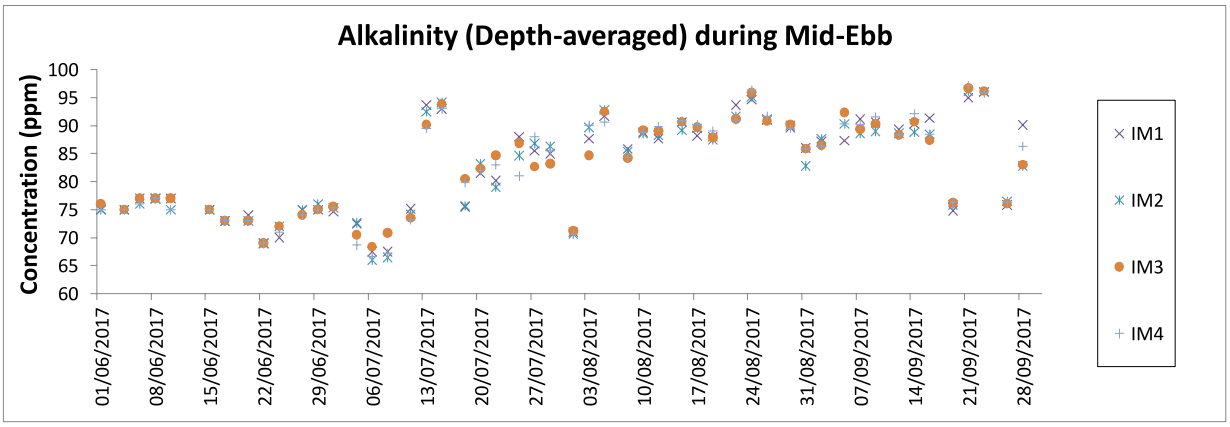


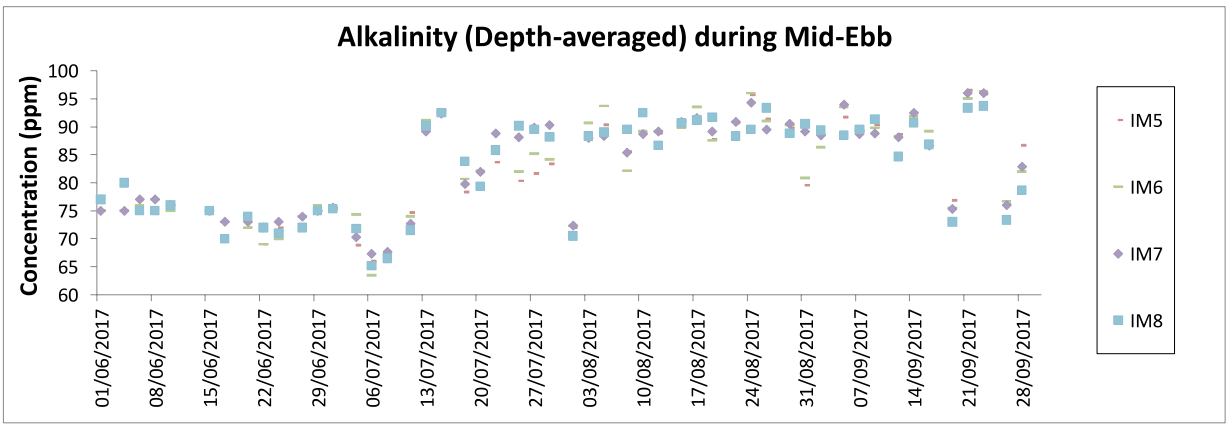


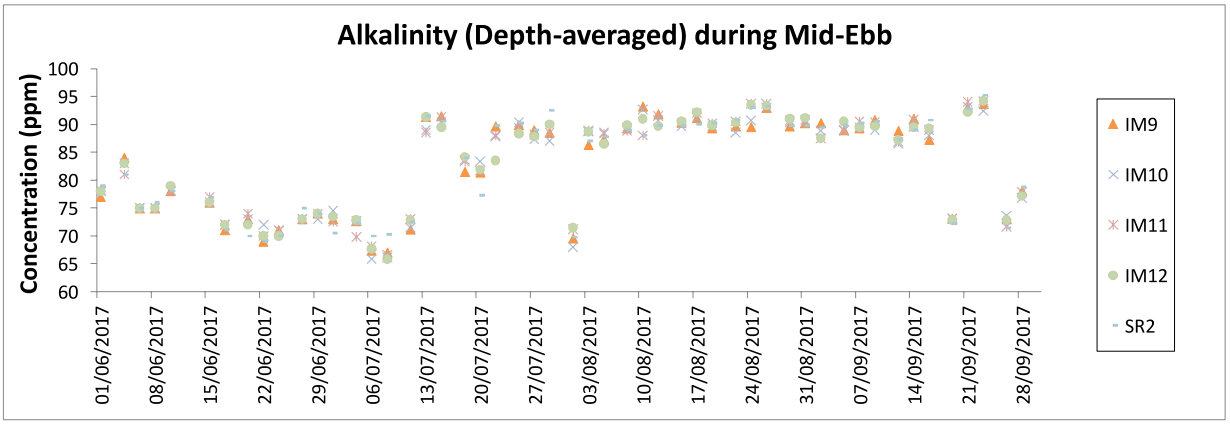


Note: The Action and Limit Levels of SS can be referred to Table 2.4 of the Quarterly EM&A Report.

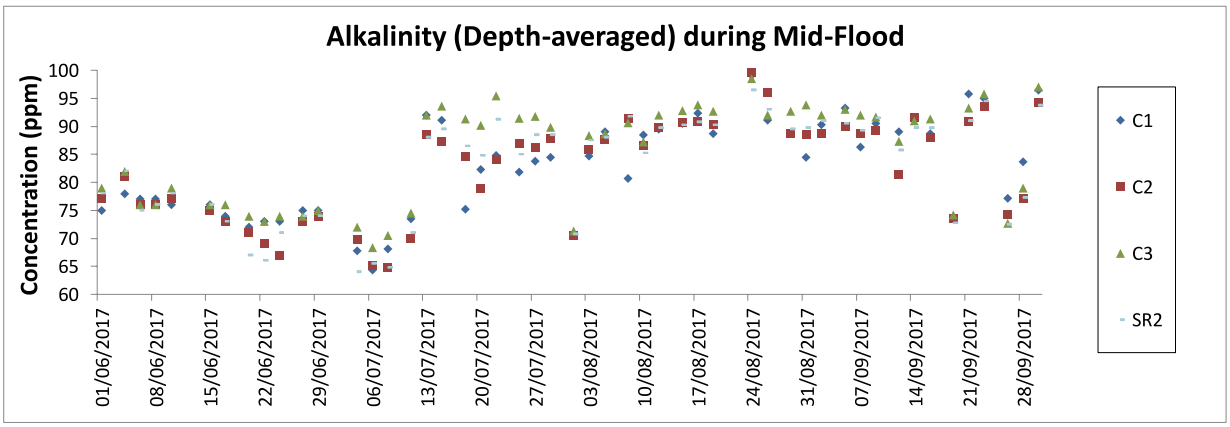


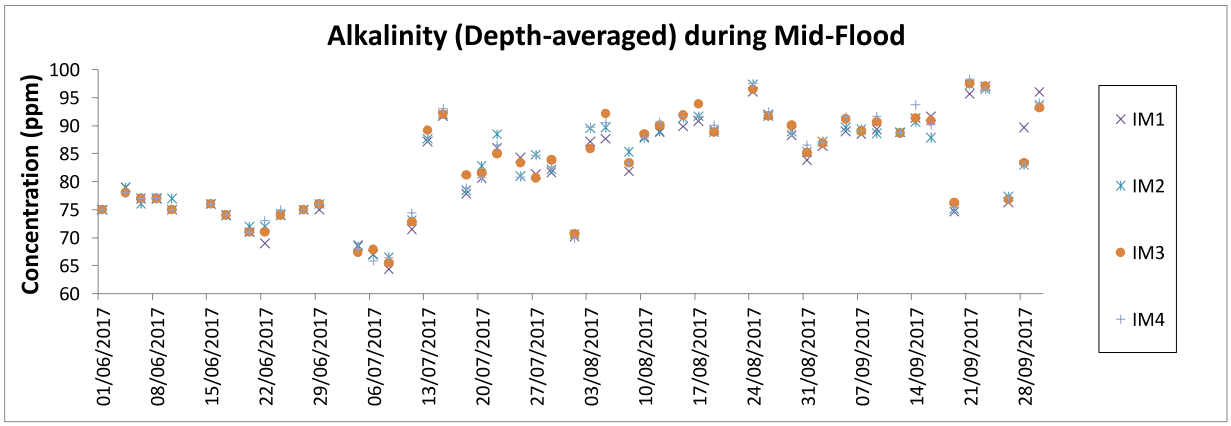


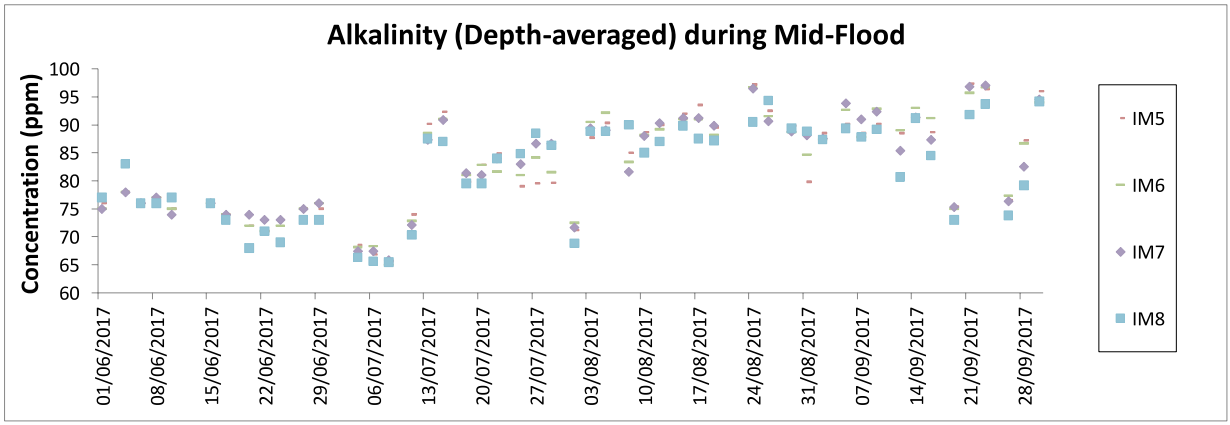


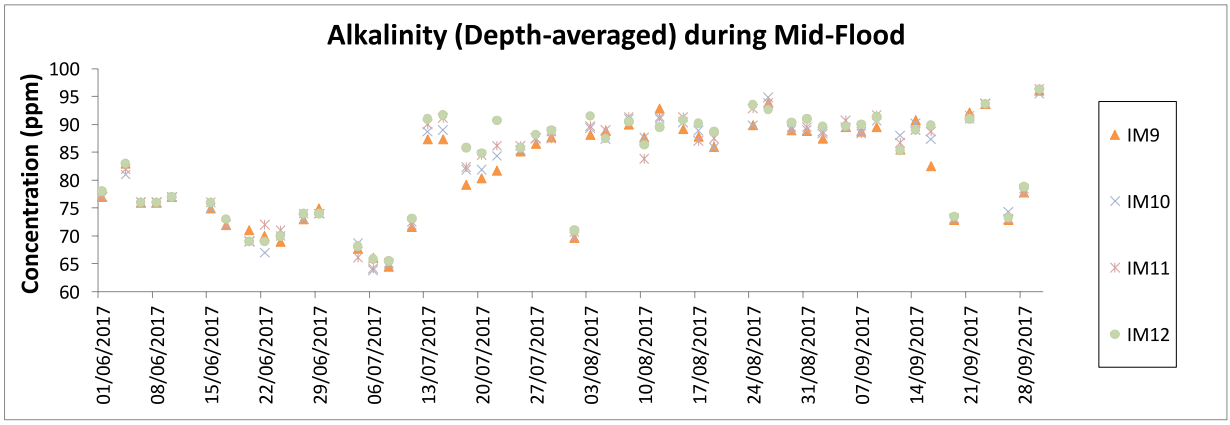


Note: The Action and Limit Levels of alkalinity can be referred to Table 2.4 of the Quarterly EM&A Report.

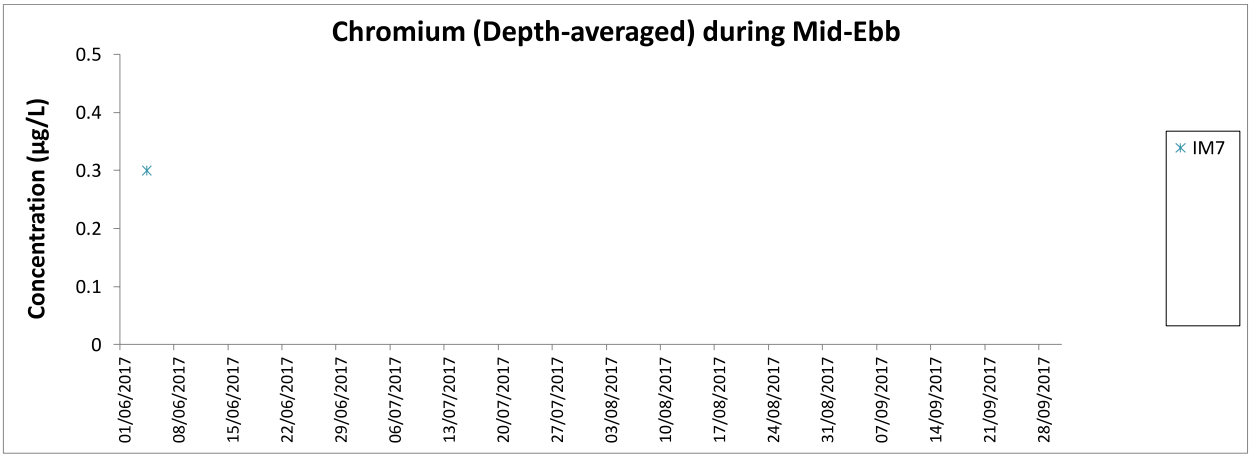




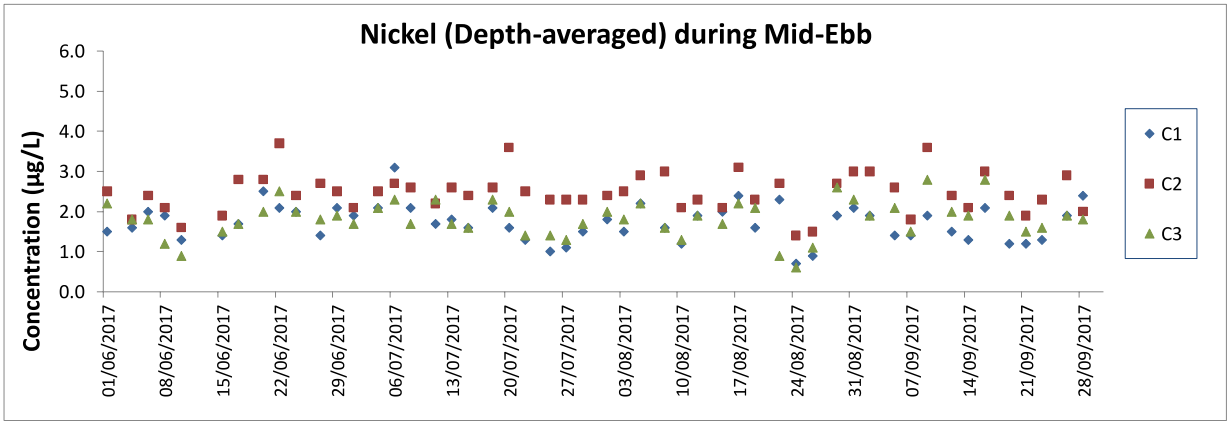


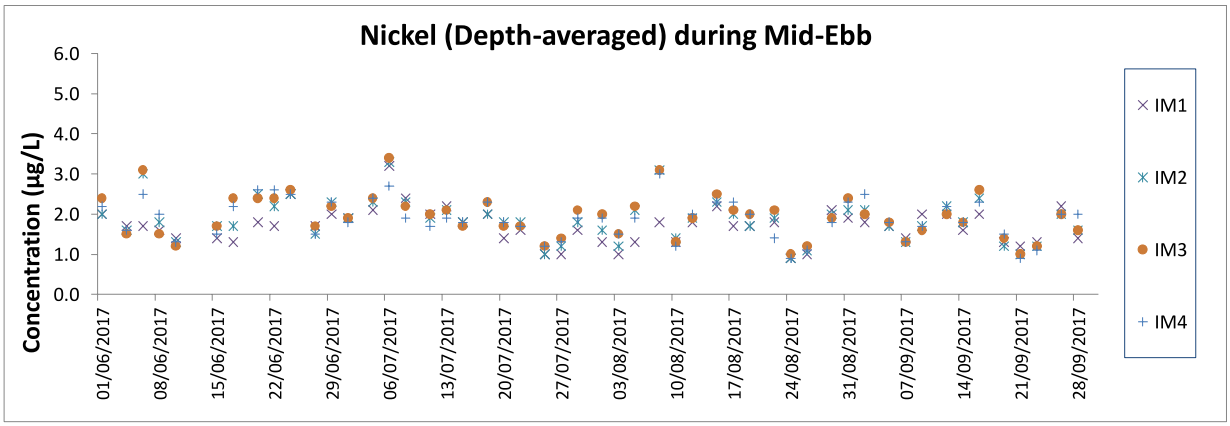


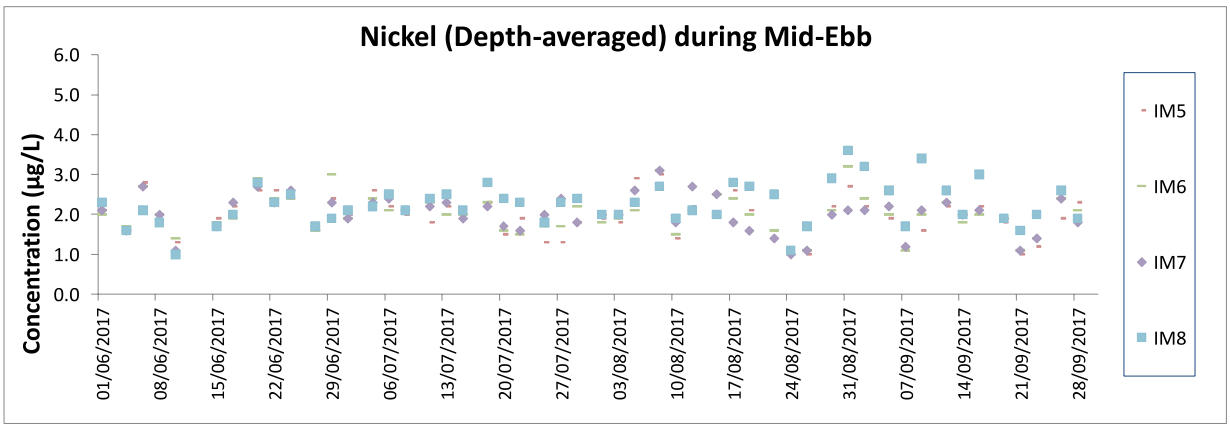
Note: The Action and Limit Levels of alkalinity can be referred to Table 2.4 of the Quarterly EM&A Report.

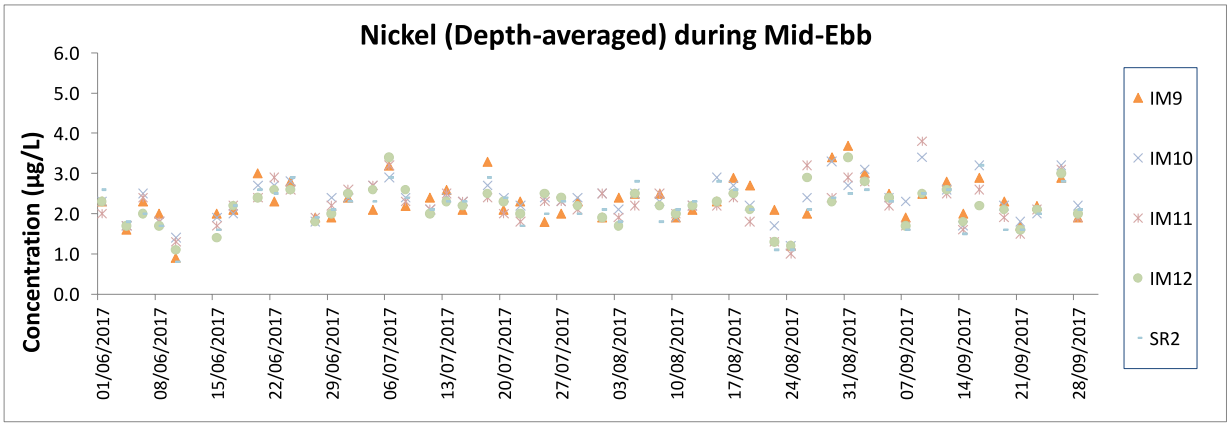


Note: The Action and Limit Levels of chromium can be referred to Table 2.4 of the Quarterly EM&A Report.
The monitoring results of chromium at all other monitoring stations during mid-ebb tide were below the reporting limit 0.2 µg/L
The monitoring results of chromium at all monitoring stations during mid-flood tide were below the reporting limit 0.2 µg/L

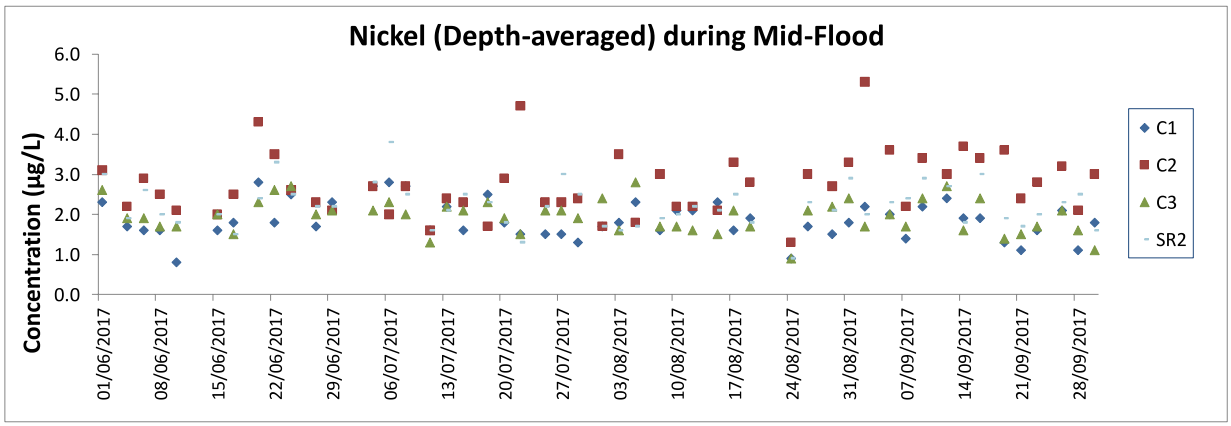


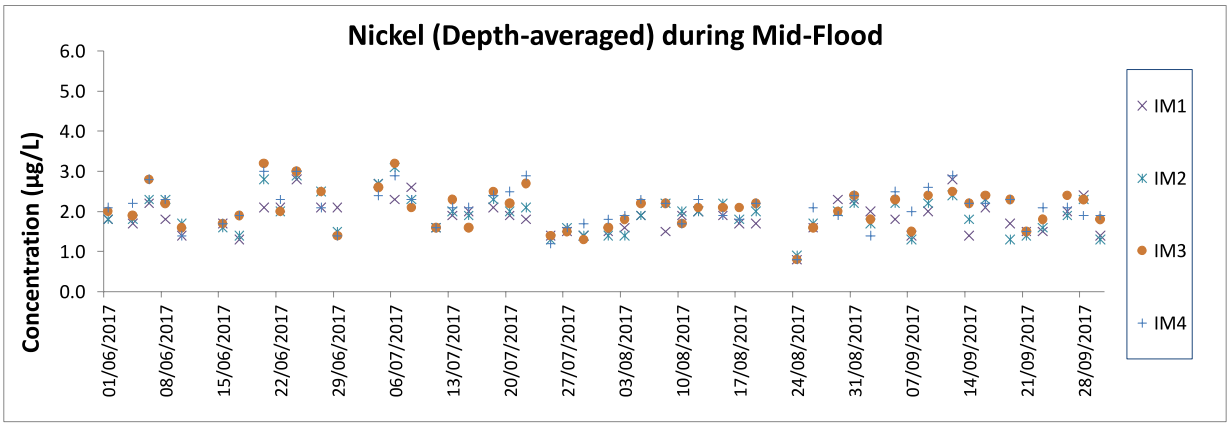


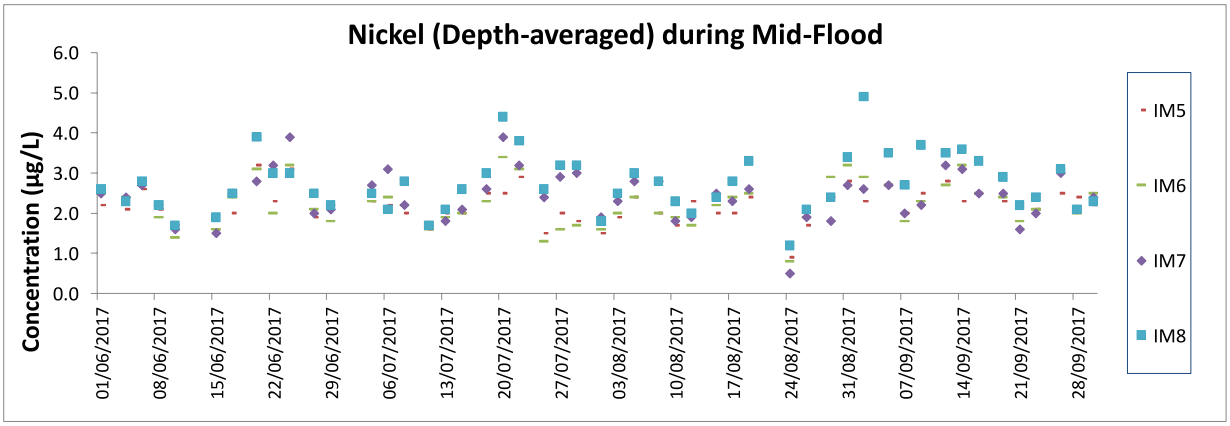


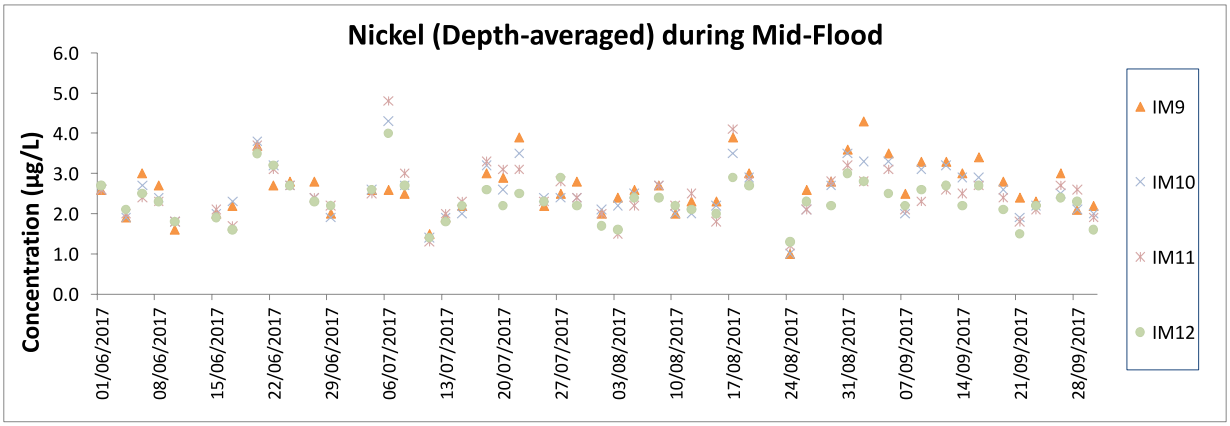


Note: The Action and Limit Levels of nickel can be referred to Table 2.4 of the Quarterly EM&A Report.









Note: The Action and Limit Levels of nickel can be referred to Table 2.4 of the Quarterly EM&A Report.

Appendix D. Summary of Chinese White Dolphin Monitoring Results

CWD Small Vessel Line-transect Survey — Survey Effort Data

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
11-Jul-17	AW	2	4.860	SUMMER	32166	3RS ET
11-Jul-17	WL	2	12.725	SUMMER	32166	3RS ET
11-Jul-17	WL	3	13.429	SUMMER	32166	3RS ET
11-Jul-17	WL	4	2.400	SUMMER	32166	3RS ET
11-Jul-17	SWL	2	1.616	SUMMER	32166	3RS ET
11-Jul-17	SWL	3	3.150	SUMMER	32166	3RS ET
12-Jul-17	NWL	1	16.730	SUMMER	32166	3RS ET
12-Jul-17	NWL	2	27.170	SUMMER	32166	3RS ET
12-Jul-17	NWL	3	30.520	SUMMER	32166	3RS ET
12-Jul-17	NWL	4	0.700	SUMMER	32166	3RS ET
13-Jul-17	NEL	2	4.253	SUMMER	32166	3RS ET
13-Jul-17	NEL	3	27.477	SUMMER	32166	3RS ET
13-Jul-17	NEL	4	14.770	SUMMER	32166	3RS ET
14-Jul-17	NWL	2	29.960	SUMMER	32166	3RS ET
14-Jul-17	NWL	3	33.840	SUMMER	32166	3RS ET
14-Jul-17	NWL	4	9.330	SUMMER	32166	3RS ET
20-Jul-17	SWL	2	9.500	SUMMER	32166	3RS ET
20-Jul-17	SWL	3	39.350	SUMMER	32166	3RS ET
20-Jul-17	SWL	4	12.780	SUMMER	32166	3RS ET
20-Jul-17	SWL	5	1.030	SUMMER	32166	3RS ET
21-Jul-17	AW	2	3.510	SUMMER	32166	3RS ET
21-Jul-17	AW	3	1.320	SUMMER	32166	3RS ET
21-Jul-17	WL	2	13.854	SUMMER	32166	3RS ET
21-Jul-17	WL	3	10.040	SUMMER	32166	3RS ET
21-Jul-17	WL	4	7.050	SUMMER	32166	3RS ET
21-Jul-17	SWL	3	1.970	SUMMER	32166	3RS ET
21-Jul-17	SWL	4	4.660	SUMMER	32166	3RS ET
25-Jul-17	NEL	2	31.060	SUMMER	32166	3RS ET
25-Jul-17	NEL	3	15.740	SUMMER	32166	3RS ET
26-Jul-17	SWL	2	41.124	SUMMER	32166	3RS ET
26-Jul-17	SWL	3	11.530	SUMMER	32166	3RS ET
26-Jul-17	SWL	4	9.430	SUMMER	32166	3RS ET
04-Aug-17	NWL	1	11.000	SUMMER	32166	3RS ET
04-Aug-17	NWL	2	20.300	SUMMER	32166	3RS ET
04-Aug-17	NWL	3	42.293	SUMMER	32166	3RS ET
04-Aug-17	NWL	4	0.300	SUMMER	32166	3RS ET
08-Aug-17	NWL	3	16.760	SUMMER	32166	3RS ET
08-Aug-17	NWL	4	57.140	SUMMER	32166	3RS ET
08-Aug-17	NWL	5	0.800	SUMMER	32166	3RS ET
09-Aug-17	NEL	2	29.120	SUMMER	32166	3RS ET
09-Aug-17	NEL	3	11.010	SUMMER	32166	3RS ET
09-Aug-17	NEL	4	4.470	SUMMER	32166	3RS ET
09-Aug-17	NEL	5	2.600	SUMMER	32166	3RS ET
14-Aug-17	AW	3	1.820	SUMMER	32166	3RS ET
14-Aug-17	AW	4	2.840	SUMMER	32166	3RS ET
14-Aug-17	WL	3	12.390	SUMMER	32166	3RS ET
14-Aug-17	WL	4	20.110	SUMMER	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
14-Aug-17	SWL	3	12.400	SUMMER	32166	3RS ET
15-Aug-17	SWL	2	24.510	SUMMER	32166	3RS ET
15-Aug-17	SWL	3	29.836	SUMMER	32166	3RS ET
15-Aug-17	SWL	4	0.740	SUMMER	32166	3RS ET
21-Aug-17	SWL	1	2.600	SUMMER	32166	3RS ET
21-Aug-17	SWL	2	48.228	SUMMER	32166	3RS ET
21-Aug-17	SWL	3	7.160	SUMMER	32166	3RS ET
21-Aug-17	SWL	4	1.530	SUMMER	32166	3RS ET
22-Aug-17	AW	0	1.880	SUMMER	32166	3RS ET
22-Aug-17	AW	1	2.410	SUMMER	32166	3RS ET
22-Aug-17	WL	1	9.997	SUMMER	32166	3RS ET
22-Aug-17	WL	2	9.174	SUMMER	32166	3RS ET
22-Aug-17	WL	3	12.400	SUMMER	32166	3RS ET
22-Aug-17	WL	4	0.900	SUMMER	32166	3RS ET
22-Aug-17	SWL	1	1.940	SUMMER	32166	3RS ET
22-Aug-17	SWL	2	0.252	SUMMER	32166	3RS ET
22-Aug-17	SWL	3	3.154	SUMMER	32166	3RS ET
25-Aug-17	NEL	1	1.900	SUMMER	32166	3RS ET
25-Aug-17	NEL	2	34.960	SUMMER	32166	3RS ET
25-Aug-17	NEL	3	9.940	SUMMER	32166	3RS ET
11-Sep-17	SWL	1	9.330	AUTUMN	32166	3RS ET
11-Sep-17	SWL	2	51.970	AUTUMN	32166	3RS ET
12-Sep-17	SWL	3	5.564	AUTUMN	32166	3RS ET
12-Sep-17	SWL	4	1.334	AUTUMN	32166	3RS ET
12-Sep-17	WL	2	23.366	AUTUMN	32166	3RS ET
12-Sep-17	WL	3	8.530	AUTUMN	32166	3RS ET
12-Sep-17	WL	4	0.590	AUTUMN	32166	3RS ET
12-Sep-17	AW	2	4.850	AUTUMN	32166	3RS ET
13-Sep-17	NEL	1	5.293	AUTUMN	32166	3RS ET
13-Sep-17	NEL	2	41.007	AUTUMN	32166	3RS ET
13-Sep-17	NEL	3	1.200	AUTUMN	32166	3RS ET
14-Sep-17	NEL	2	21.130	AUTUMN	32166	3RS ET
14-Sep-17	NEL	3	24.570	AUTUMN	32166	3RS ET
14-Sep-17	NEL	4	1.500	AUTUMN	32166	3RS ET
18-Sep-17	NWL	1	1.020	AUTUMN	32166	3RS ET
18-Sep-17	NWL	2	26.330	AUTUMN	32166	3RS ET
18-Sep-17	NWL	3	19.210	AUTUMN	32166	3RS ET
18-Sep-17	NWL	4	22.550	AUTUMN	32166	3RS ET
19-Sep-17	AW	2	2.890	AUTUMN	32166	3RS ET
19-Sep-17	AW	3	1.840	AUTUMN	32166	3RS ET
19-Sep-17	WL	1	3.460	AUTUMN	32166	3RS ET
19-Sep-17	WL	2	4.998	AUTUMN	32166	3RS ET
19-Sep-17	WL	3	7.760	AUTUMN	32166	3RS ET
19-Sep-17	WL	4	13.081	AUTUMN	32166	3RS ET
19-Sep-17	SWL	2	3.010	AUTUMN	32166	3RS ET
19-Sep-17	SWL	3	3.250	AUTUMN	32166	3RS ET
19-Sep-17	SWL	4	5.750	AUTUMN	32166	3RS ET
20-Sep-17	SWL	2	13.420	AUTUMN	32166	3RS ET
20-Sep-17	SWL	3	38.810	AUTUMN	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
20-Sep-17	SWL	4	4.360	AUTUMN	32166	3RS ET
21-Sep-17	NWL	1	4.500	AUTUMN	32166	3RS ET
21-Sep-17	NWL	2	67.480	AUTUMN	32166	3RS ET

CWD Small Vessel Line-transect Survey — Sighting Data

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
11-Jul-17	1	1038	CWD	2	WL	2	82	ON	3RS ET	22.2668	113.8592	SUMMER	NONE
11-Jul-17	2	1055	CWD	8	WL	2	19	ON	3RS ET	22.2608	113.8536	SUMMER	NONE
11-Jul-17	3	1133	CWD	2	WL	3	351	ON	3RS ET	22.2498	113.8403	SUMMER	NONE
11-Jul-17	4	1144	CWD	1	WL	2	8	ON	3RS ET	22.2500	113.8500	SUMMER	NONE
11-Jul-17	5	1159	CWD	4	WL	2	726	ON	3RS ET	22.2432	113.8488	SUMMER	NONE
11-Jul-17	6	1216	CWD	1	WL	2	17	ON	3RS ET	22.2414	113.8463	SUMMER	NONE
11-Jul-17	7	1242	CWD	2	WL	3	11	ON	3RS ET	22.2279	113.8378	SUMMER	NONE
11-Jul-17	8	1259	CWD	2	WL	3	196	ON	3RS ET	22.2185	113.8137	SUMMER	NONE
11-Jul-17	9	1318	CWD	2	WL	3	16	ON	3RS ET	22.2143	113.8333	SUMMER	NONE
11-Jul-17	10	1350	CWD	7	WL	4	324	ON	3RS ET	22.1969	113.8397	SUMMER	NONE
11-Jul-17	11	1414	CWD	3	WL	4	157	ON	3RS ET	22.1864	113.8401	SUMMER	NONE
11-Jul-17	12	1435	CWD	4	SWL	2	118	ON	3RS ET	22.1903	113.8499	SUMMER	NONE
11-Jul-17	13	1506	CWD	4	SWL	2	299	ON	3RS ET	22.1883	113.8593	SUMMER	NONE
12-Jul-17	1	0950	CWD	2	NWL	1	70	ON	3RS ET	22.3715	113.8673	SUMMER	NONE
12-Jul-17	2	1316	CWD	1	NWL	3	102	ON	3RS ET	22.3998	113.8983	SUMMER	NONE
14-Jul-17	1	0953	CWD	1	NWL	3	351	ON	3RS ET	22.3615	113.8666	SUMMER	NONE
14-Jul-17	2	1048	CWD	2	NWL	2	890	ON	3RS ET	22.2773	113.8689	SUMMER	NONE
14-Jul-17	3	1210	CWD	1	NWL	2	169	ON	3RS ET	22.3909	113.8780	SUMMER	NONE
20-Jul-17	1	1412	CWD	2	SWL	3	319	ON	3RS ET	22.1776	113.8785	SUMMER	NONE
20-Jul-17	2	1457	CWD	1	SWL	3	2226	ON	3RS ET	22.1900	113.8678	SUMMER	NONE
20-Jul-17	3	1524	CWD	3	WL	2	N/A	OFF	3RS ET	22.2178	113.8339	SUMMER	NONE
21-Jul-17	1	1032	CWD	5	WL	2	20	ON	3RS ET	22.2649	113.8585	SUMMER	NONE
21-Jul-17	2	1131	CWD	2	WL	3	65	ON	3RS ET	22.2318	113.8372	SUMMER	NONE
21-Jul-17	3	1151	CWD	2	WL	2	17	ON	3RS ET	22.2288	113.8383	SUMMER	NONE
21-Jul-17	4	1208	CWD	2	WL	3	190	ON	3RS ET	22.2182	113.8138	SUMMER	NONE
21-Jul-17	5	1223	CWD	2	WL	4	27	ON	3RS ET	22.2139	113.8322	SUMMER	NONE
21-Jul-17	6	1243	CWD	1	WL	4	62	ON	3RS ET	22.2048	113.8383	SUMMER	NONE
21-Jul-17	7	1310	CWD	6	WL	3	27	ON	3RS ET	22.1956	113.8425	SUMMER	NONE
26-Jul-17	1	1026	CWD	1	WL	2	N/A	OFF	3RS ET	22.2362	113.8409	SUMMER	NONE
26-Jul-17	2	1033	CWD	2	WL	2	N/A	OFF	3RS ET	22.2183	113.8339	SUMMER	NONE
26-Jul-17	3	1045	CWD	2	SWL	2	N/A	OFF	3RS ET	22.1948	113.8509	SUMMER	NONE

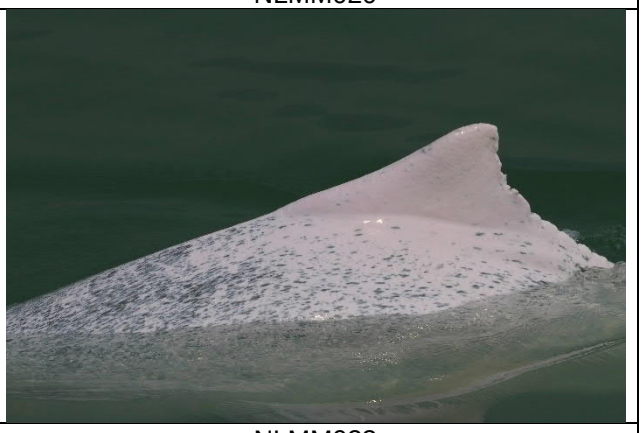
DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
26-Jul-17	4	1056	CWD	3	SWL	2	252	ON	3RS ET	22.1999	113.8684	SUMMER	NONE
26-Jul-17	5	1301	CWD	7	SWL	2	234	ON	3RS ET	22.2036	113.9083	SUMMER	NONE
26-Jul-17	6	1411	FP	2	SWL	3	87	ON	3RS ET	22.1534	113.9183	SUMMER	NONE
26-Jul-17	7	1437	CWD	2	SWL	3	711	ON	3RS ET	22.2040	113.9181	SUMMER	GILLNET
04-Aug-17	1	1202	CWD	2	NWL	3	41	ON	3RS ET	22.4075	113.8878	SUMMER	NONE
04-Aug-17	2	1322	CWD	3	NWL	3	42	ON	3RS ET	22.3735	113.8980	SUMMER	NONE
04-Aug-17	3	1339	CWD	3	NWL	1	3	ON	3RS ET	22.3782	113.8978	SUMMER	NONE
08-Aug-17	1	1305	CWD	2	NWL	4	N/A	OFF	3RS ET	22.3817	113.8981	SUMMER	NONE
14-Aug-17	1	1121	CWD	1	WL	3	98	ON	3RS ET	22.2321	113.8264	SUMMER	NONE
14-Aug-17	2	1242	CWD	2	WL	4	149	ON	3RS ET	22.1874	113.8301	SUMMER	NONE
14-Aug-17	3	1252	CWD	4	WL	4	N/A	OFF	3RS ET	22.1920	113.8425	SUMMER	NONE
14-Aug-17	4	1316	CWD	1	SWL	3	N/A	OFF	3RS ET	22.1906	113.8491	SUMMER	NONE
15-Aug-17	1	1029	CWD	1	SWL	2	303	ON	3RS ET	22.2108	113.9358	SUMMER	NONE
15-Aug-17	2	1131	CWD	1	SWL	3	182	ON	3RS ET	22.1818	113.9276	SUMMER	NONE
15-Aug-17	3	1255	CWD	5	SWL	2	146	ON	3RS ET	22.1784	113.9041	SUMMER	NONE
15-Aug-17	4	1338	CWD	1	SWL	3	1090	ON	3RS ET	22.1901	113.8967	SUMMER	NONE
15-Aug-17	5	1343	CWD	8	SWL	3	477	ON	3RS ET	22.1853	113.8973	SUMMER	NONE
15-Aug-17	6	1407	CWD	1	SWL	2	783	ON	3RS ET	22.1756	113.8969	SUMMER	NONE
15-Aug-17	7	1455	CWD	3	SWL	2	11	ON	3RS ET	22.1794	113.8876	SUMMER	NONE
21-Aug-17	1	1232	CWD	3	SWL	3	156	ON	3RS ET	22.1673	113.9050	SUMMER	GILLNET
21-Aug-17	2	1333	CWD	2	SWL	2	29	ON	3RS ET	22.1789	113.8982	SUMMER	NONE
21-Aug-17	3	1344	CWD	8	SWL	2	713	ON	3RS ET	22.1741	113.8972	SUMMER	NONE
21-Aug-17	4	1431	CWD	8	SWL	2	174	ON	3RS ET	22.1729	113.8875	SUMMER	NONE
21-Aug-17	5	1516	CWD	3	SWL	2	15	ON	3RS ET	22.1796	113.8786	SUMMER	NONE
21-Aug-17	6	1539	CWD	2	SWL	2	126	ON	3RS ET	22.1665	113.8688	SUMMER	NONE
21-Aug-17	7	1549	CWD	2	SWL	2	28	ON	3RS ET	22.1720	113.8690	SUMMER	NONE
22-Aug-17	1	0943	CWD	1	AW	1	87	ON	3RS ET	22.2965	113.8825	SUMMER	NONE
22-Aug-17	2	1031	CWD	1	WL	1	37	ON	3RS ET	22.2776	113.8518	SUMMER	NONE
22-Aug-17	3	1043	CWD	2	WL	1	6	ON	3RS ET	22.2684	113.8457	SUMMER	NONE
22-Aug-17	4	1059	CWD	2	WL	1	140	ON	3RS ET	22.2656	113.8585	SUMMER	NONE
22-Aug-17	5	1112	CWD	1	WL	1	189	ON	3RS ET	22.2609	113.8550	SUMMER	NONE
22-Aug-17	6	1127	CWD	6	WL	1	84	ON	3RS ET	22.2602	113.8396	SUMMER	NONE
22-Aug-17	7	1202	CWD	4	WL	2	149	ON	3RS ET	22.2419	113.8404	SUMMER	NONE

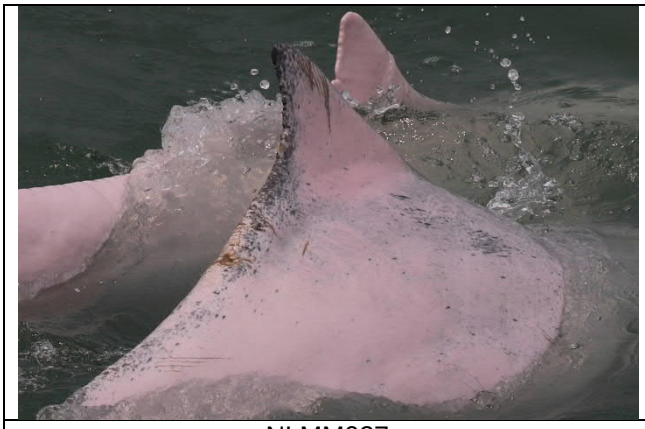
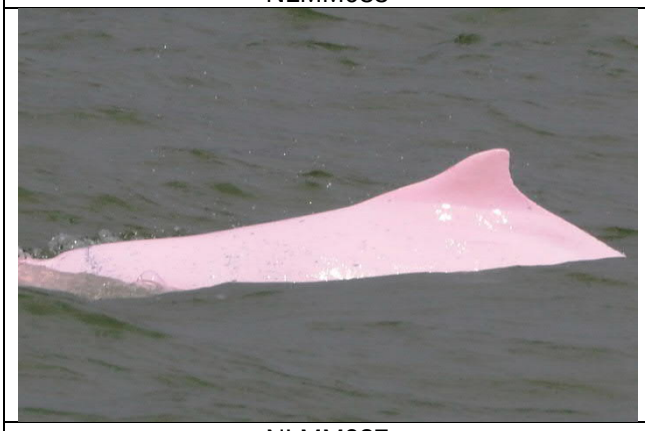
DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
22-Aug-17	8	1326	CWD	1	WL	3	31	ON	3RS ET	22.1875	113.8419	SUMMER	NONE
22-Aug-17	9	1335	CWD	4	WL	2	376	ON	3RS ET	22.1865	113.8386	SUMMER	NONE
22-Aug-17	10	1408	CWD	3	SWL	3	182	ON	3RS ET	22.1718	113.8533	SUMMER	NONE
22-Aug-17	11	1432	CWD	4	SWL	2	210	ON	3RS ET	22.1748	113.8594	SUMMER	NONE
11-Sep-17	1	1131	CWD	1	SWL	2	83	ON	3RS ET	22.2054	113.9212	AUTUMN	NONE
11-Sep-17	2	1344	CWD	4	SWL	1	780	ON	3RS ET	22.1795	113.8881	AUTUMN	NONE
12-Sep-17	1	1045	CWD	1	SWL	4	93	ON	3RS ET	22.1932	113.8584	AUTUMN	NONE
12-Sep-17	2	1110	CWD	3	SWL	3	N/A	OFF	3RS ET	22.1814	113.8492	AUTUMN	NONE
12-Sep-17	3	1211	CWD	4	WL	2	53	ON	3RS ET	22.2150	113.8309	AUTUMN	NONE
12-Sep-17	4	1347	CWD	3	WL	2	60	ON	3RS ET	22.2608	113.8471	AUTUMN	NONE
12-Sep-17	5	1358	CWD	3	WL	2	107	ON	3RS ET	22.2640	113.8582	AUTUMN	NONE
18-Sep-17	1	1009	CWD	15	NWL	2	248	ON	3RS ET	22.3365	113.8679	AUTUMN	NONE
18-Sep-17	2	1211	CWD	2	NWL	2	151	ON	3RS ET	22.4006	113.8778	AUTUMN	NONE
18-Sep-17	3	1345	CWD	1	NWL	3	65	ON	3RS ET	22.4003	113.8976	AUTUMN	NONE
19-Sep-17	1	1020	CWD	6	WL	1	860	ON	3RS ET	22.2745	113.8488	AUTUMN	NONE
19-Sep-17	2	1106	CWD	4	WL	2	57	ON	3RS ET	22.2652	113.8578	AUTUMN	NONE
19-Sep-17	3	1126	CWD	2	WL	2	428	ON	3RS ET	22.2603	113.8454	AUTUMN	NONE
19-Sep-17	4	1134	CWD	1	WL	3	30	ON	3RS ET	22.2573	113.8371	AUTUMN	NONE
19-Sep-17	5	1145	CWD	1	WL	3	18	ON	3RS ET	22.2497	113.8429	AUTUMN	NONE
19-Sep-17	6	1202	CWD	3	WL	3	73	ON	3RS ET	22.2408	113.8386	AUTUMN	NONE
19-Sep-17	7	1258	CWD	1	WL	4	113	ON	3RS ET	22.2053	113.8363	AUTUMN	NONE
19-Sep-17	8	1420	CWD	1	SWL	2	261	ON	3RS ET	22.2004	113.8659	AUTUMN	NONE
20-Sep-17	1	1215	CWD	7	SWL	2	305	ON	3RS ET	22.1643	113.9011	AUTUMN	NONE
20-Sep-17	2	1332	CWD	5	SWL	3	90	ON	3RS ET	22.1576	113.8969	AUTUMN	NONE
20-Sep-17	3	1434	CWD	3	SWL	2	496	ON	3RS ET	22.2053	113.8777	AUTUMN	NONE
20-Sep-17	4	1534	CWD	3	SWL	3	N/A	OFF	3RS ET	22.1931	113.8450	AUTUMN	NONE
21-Sep-17	1	0952	CWD	1	NWL	2	1308	ON	3RS ET	22.3786	113.8681	AUTUMN	NONE
21-Sep-17	2	1005	CWD	1	NWL	2	N/A	OFF	3RS ET	22.3685	113.8679	AUTUMN	NONE
21-Sep-17	3	1148	CWD	1	NWL	2	284	ON	3RS ET	22.3730	113.8773	AUTUMN	NONE
21-Sep-17	4	1204	CWD	2	NWL	2	124	ON	3RS ET	22.3901	113.8784	AUTUMN	NONE

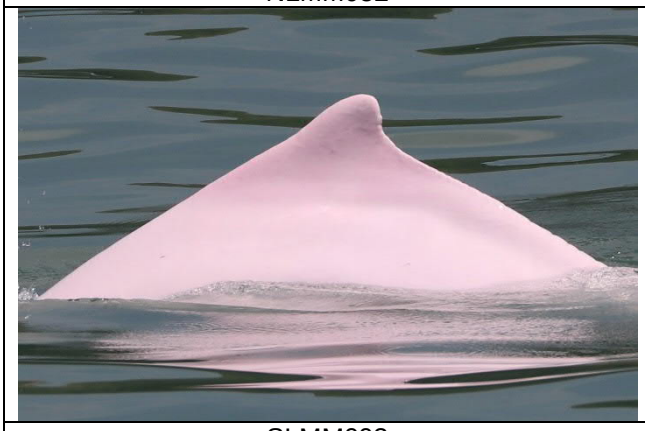
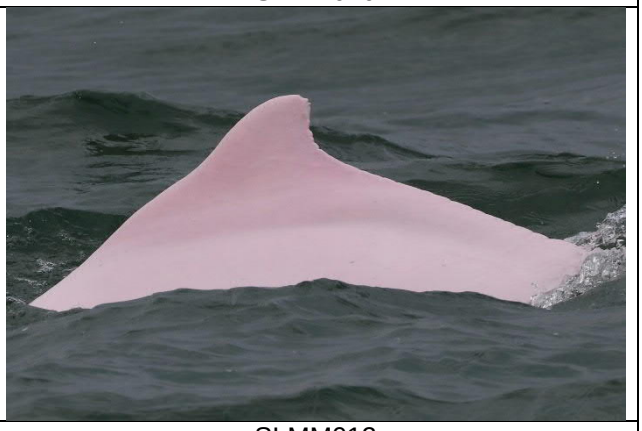
Abbreviations: STG# = Sighting Number; GP SZ = Dolphin Group Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance (in metres); N/A = Not Applicable; DEC LAT = Latitude (WGS84 in Decimal), DEC LON = Longitude (WGS84 in Decimal); BOAT ASSOC. = Fishing Boat Association

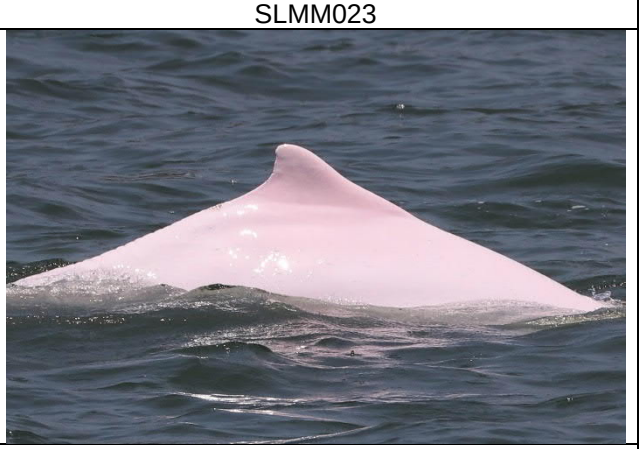
Sighting data of finless porpoise (FP) are presented for reference only. No relevant figure or text will be mentioned in the quarterly EM&A report. All FP sightings are excluded in calculation.

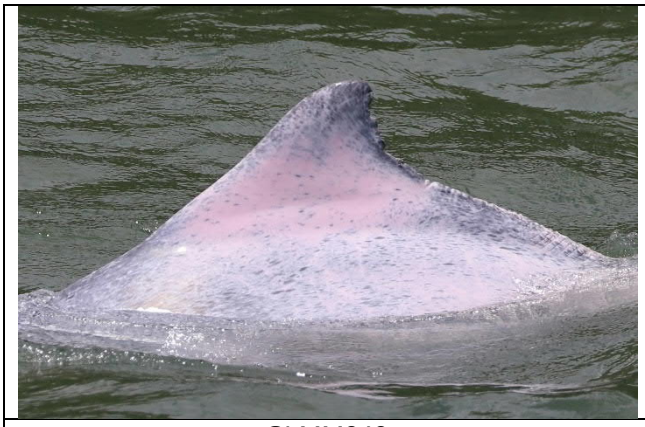
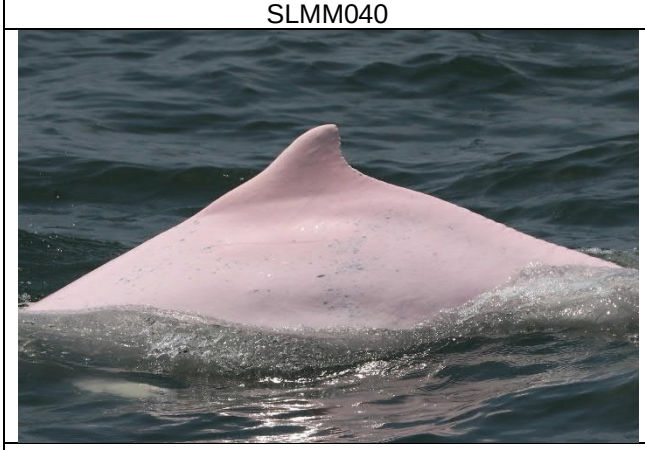
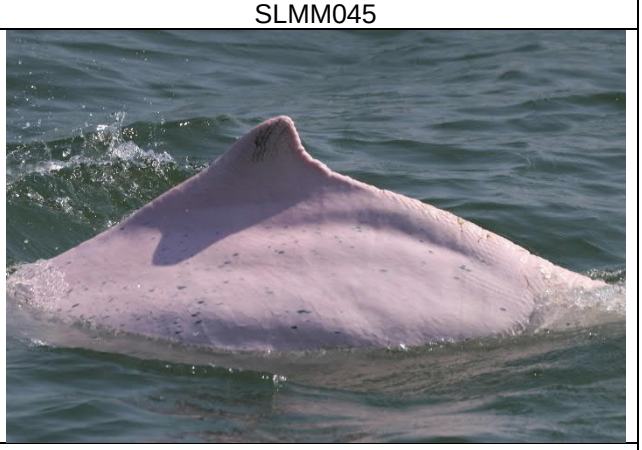
CWD Small Vessel Line-transect Survey **Photo Identification**

	
NLMM005	NLMM013
	
NLMM019	NLMM020
	
NLMM022	NLMM023

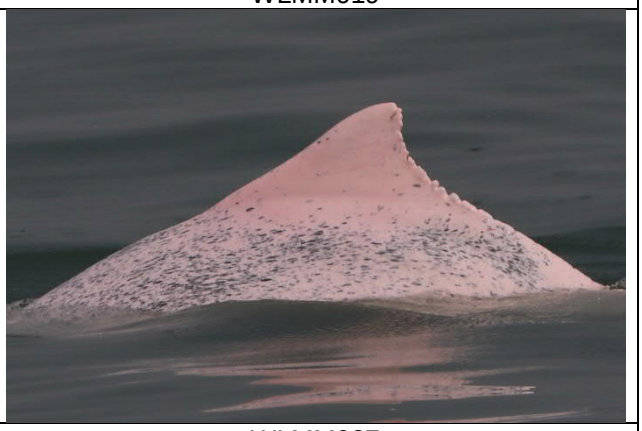
	
NLMM027	NLMM028 (Upper One)
	
NLMM033	NLMM034
	
NLMM037	NLMM040
	
NLMM041	NLMM042

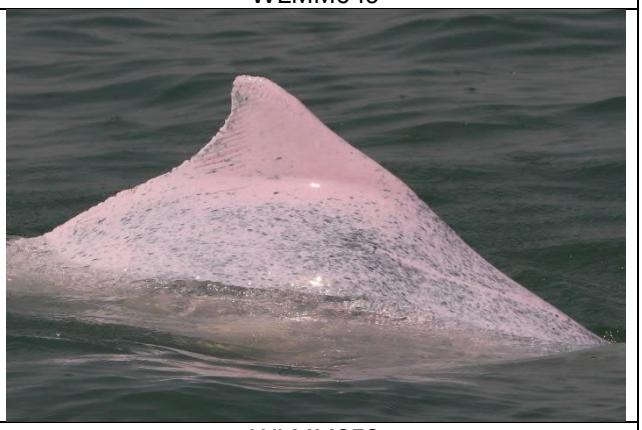
	
NLMM050	NLMM051
	
NLMM052	NLMM053
	
SLMM003	SLMM010
	
SLMM011	SLMM012

	
SLMM014	SLMM015
	
SLMM017	SLMM023
	
SLMM030	SLMM034
	
SLMM036	SLMM037

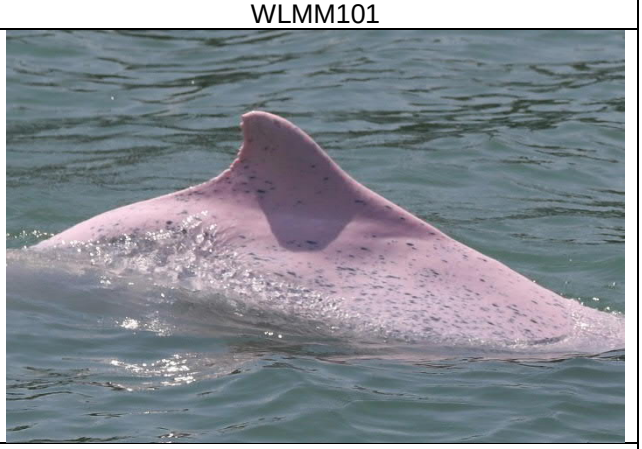
	
SLMM040	SLMM045
	
SLMM050	SLMM054
	
SLMM057	SLMM059
	
SLMM060	SLMM061

	
SLMM062	WLMM063
	
SLMM064	WLMM001
	
WLMM003	WLMM006
	
WLMM008	WLMM009

	
WLMM011	WLMM013
	
WLMM015	WLMM019
	
WLMM020	WLMM027
	
WLMM028	WLMM029

	
WLMM032	WLMM038
	
WLMM043	WLMM046
	
WLMM047	WLMM049
	
WLMM051	WLMM053

	
WLMM056	WLMM067
	
WLMM076	WLMM078
	
WLMM079	WLMM089
	
WLMM096	WLMM097

	
WLMM098	WLMM099
	
WLMM100	WLMM101
	
WLMM102	WLMM103

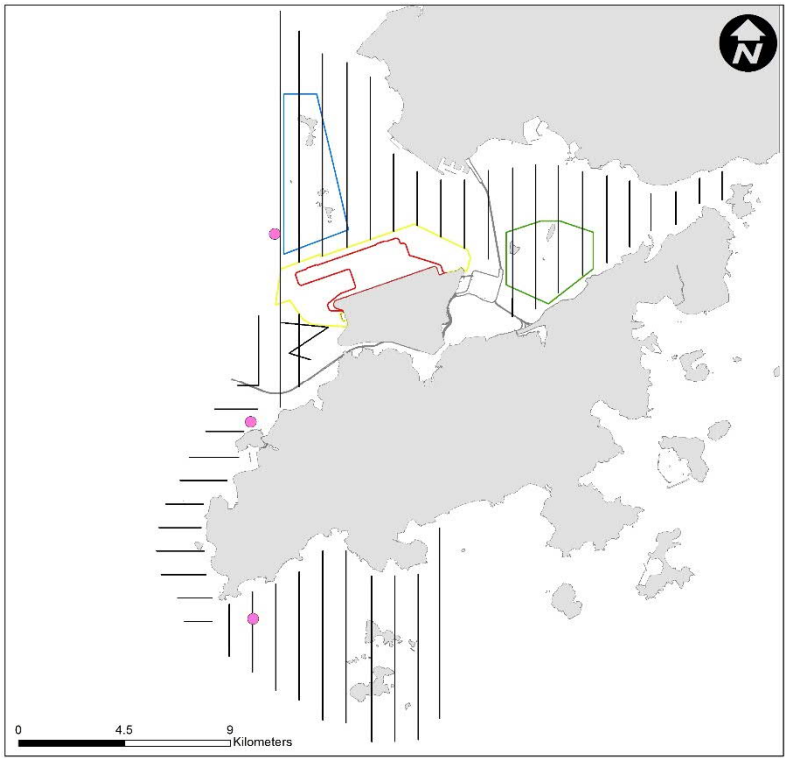
CWD Small Vessel Line-transect Survey **Photo Identification – Re-sighting Locations**

[Pink circle: Sighting locations of individual dolphin; Black line: Vessel survey transects; Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP); Green polygon: Brothers Marine Park (BMP); Red polygon: 3RS land-formation footprint; Yellow line: 3RS temporary works area boundary]

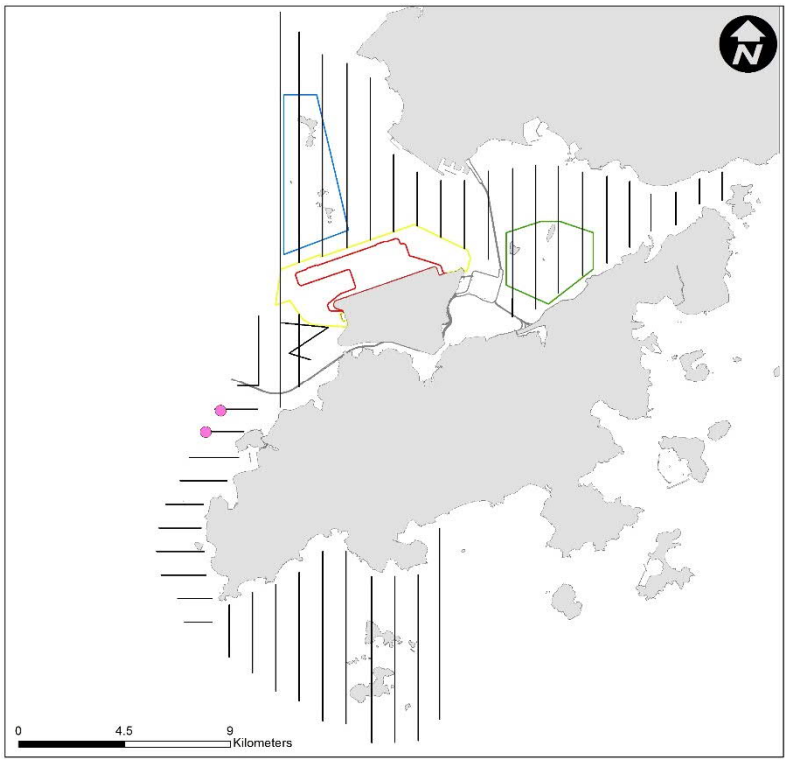
NLMM019

NLMM020

NLMM023

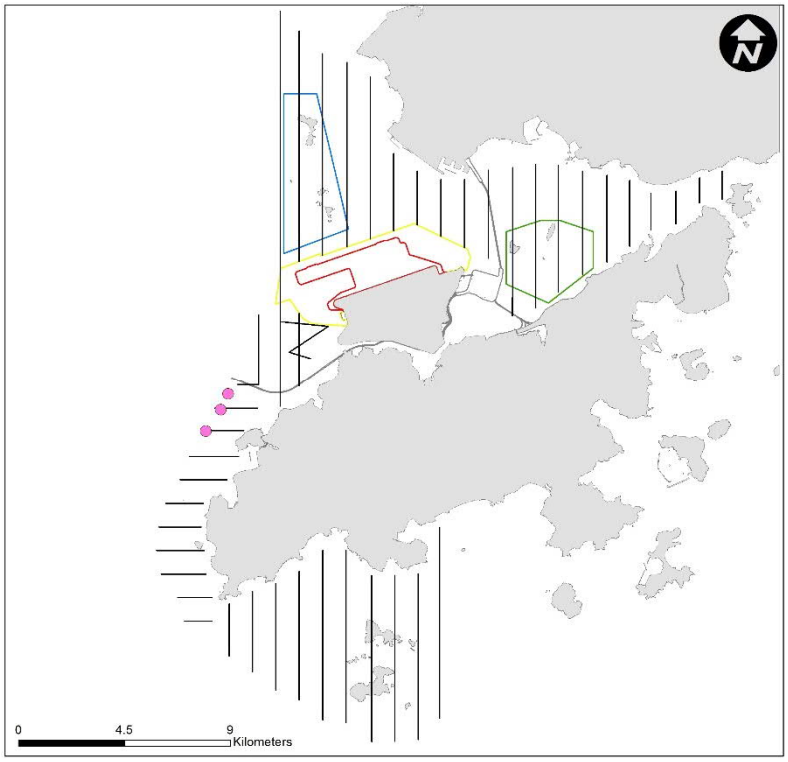


NLMM033



NLMM034

NLMM051

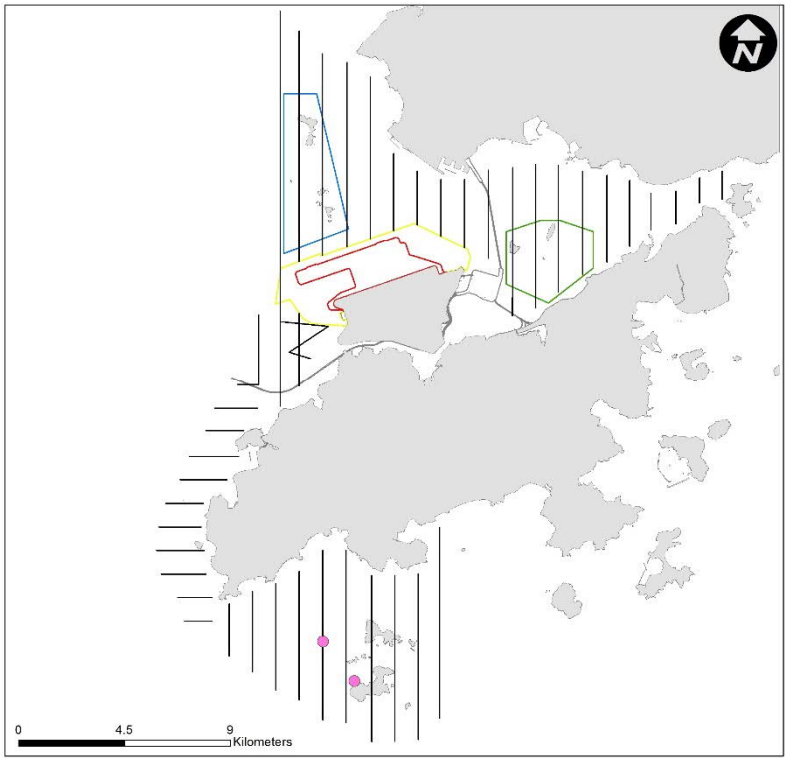


NLMM052

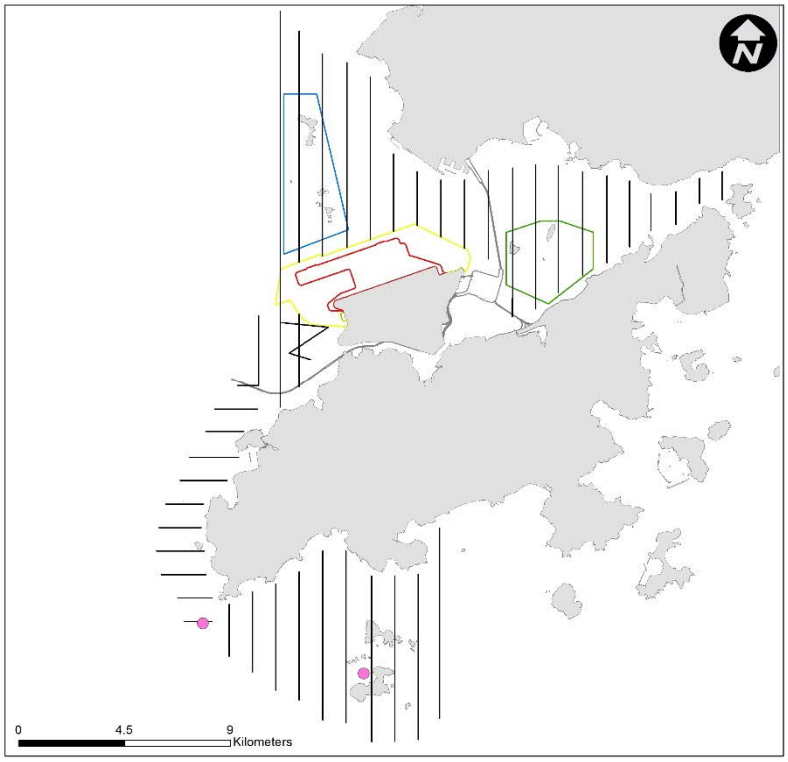
SLMM012

SLMM015

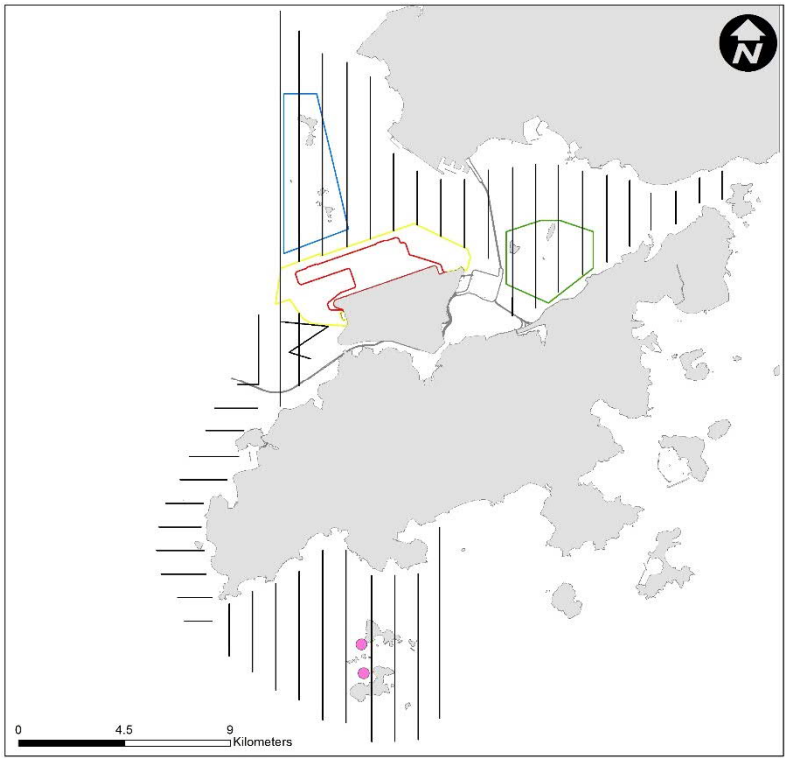
SLMM017



SLMM023



SLMM034

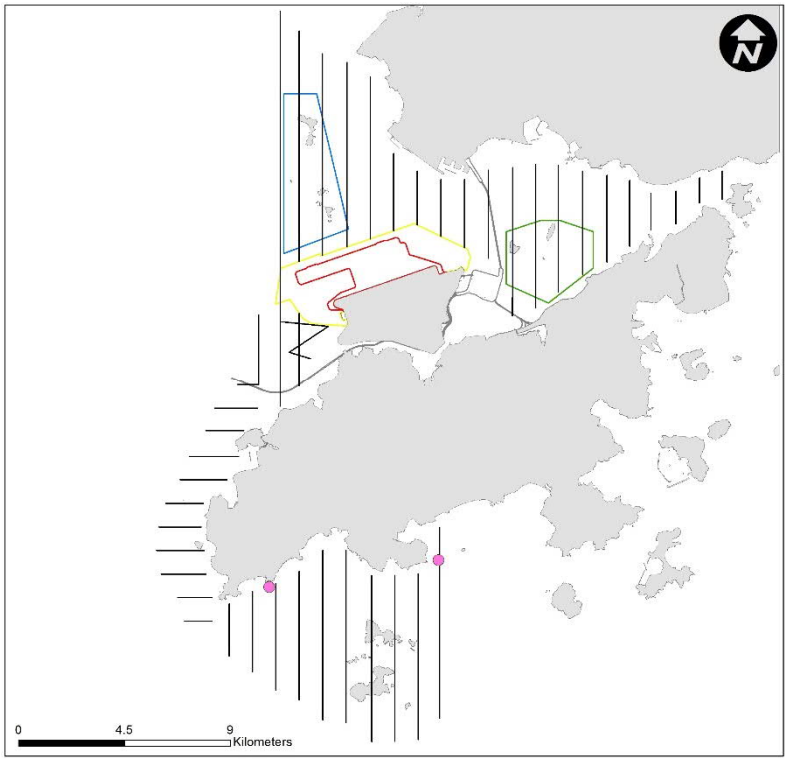


SLMM040

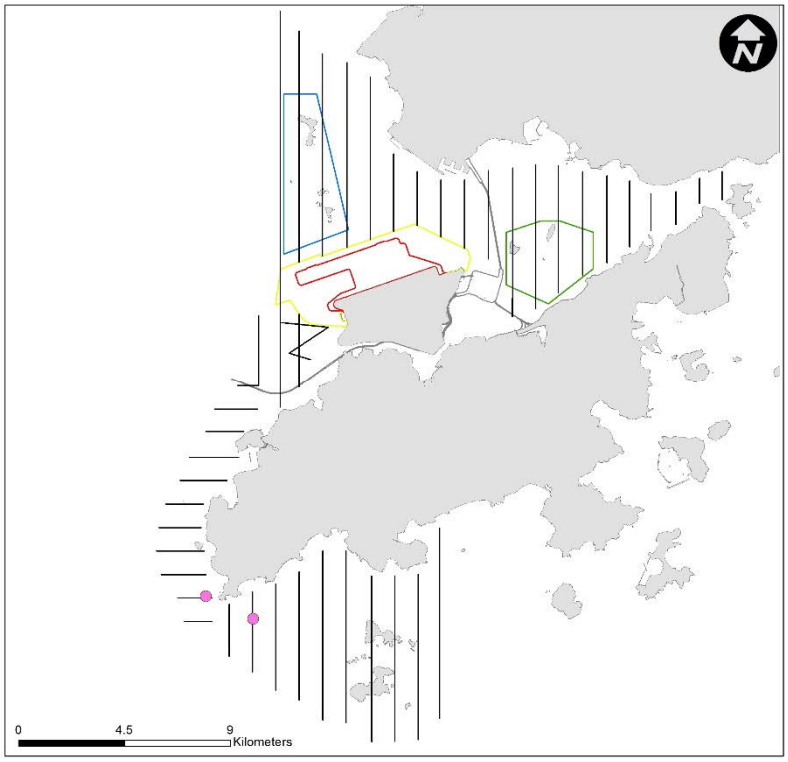
SLMM045

SLMM050

SLMM054



WLMM001



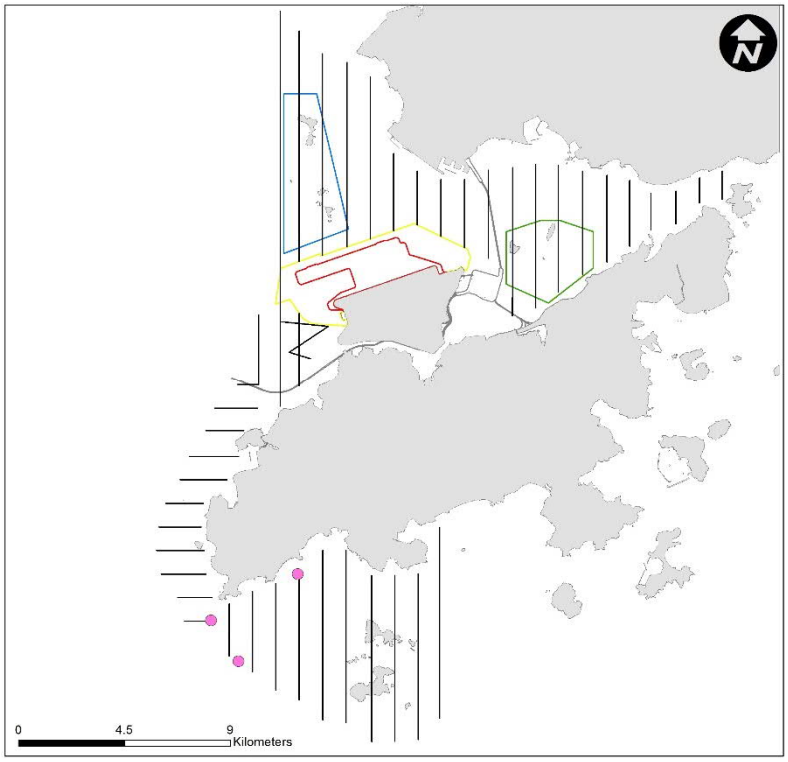
WLMM003

WLMM006

WLMM008

WLMM009

WLMM011



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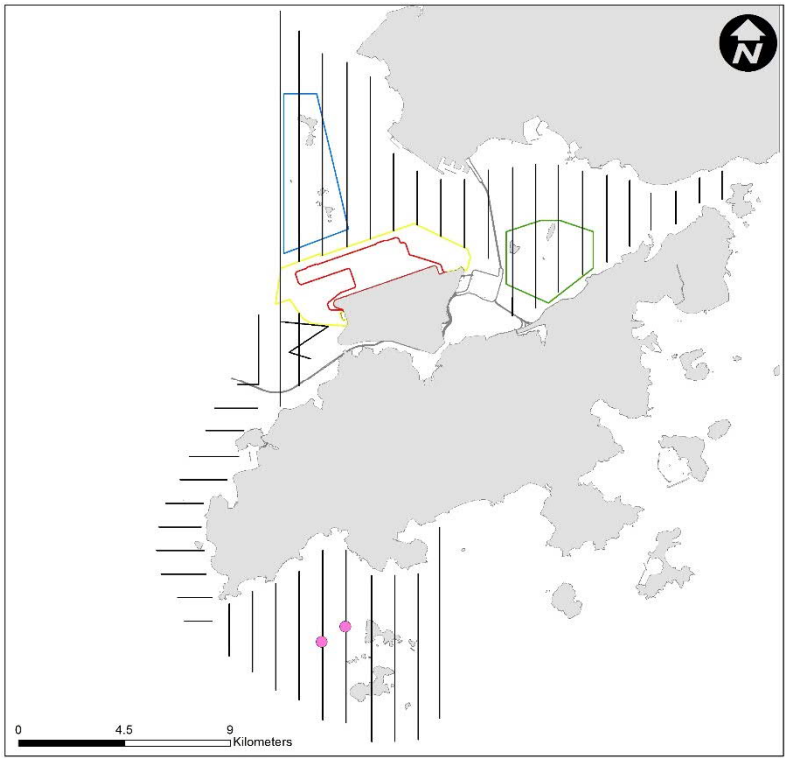
WLMM020



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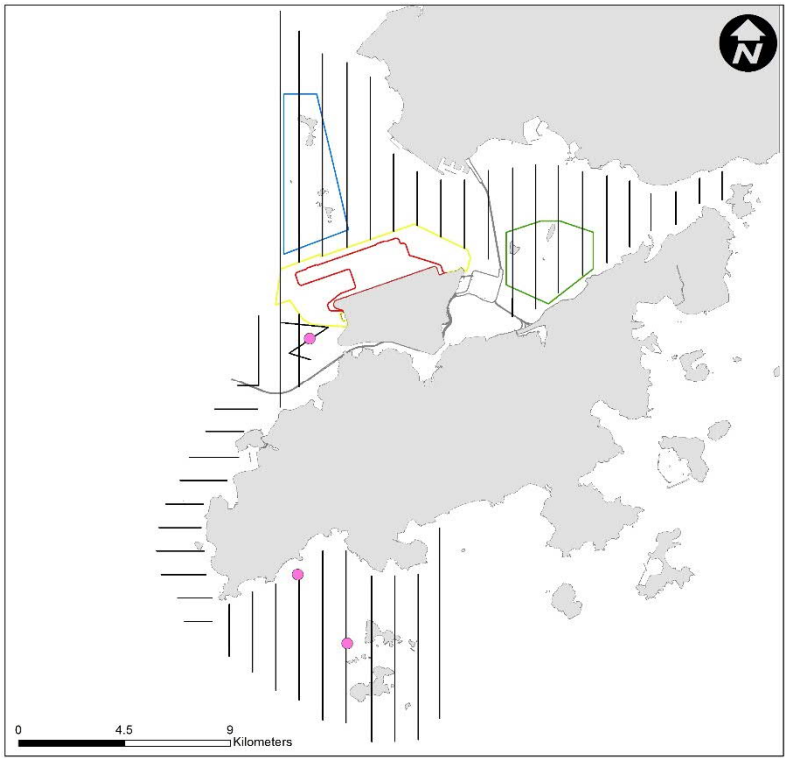

WLMM028

WLMM043

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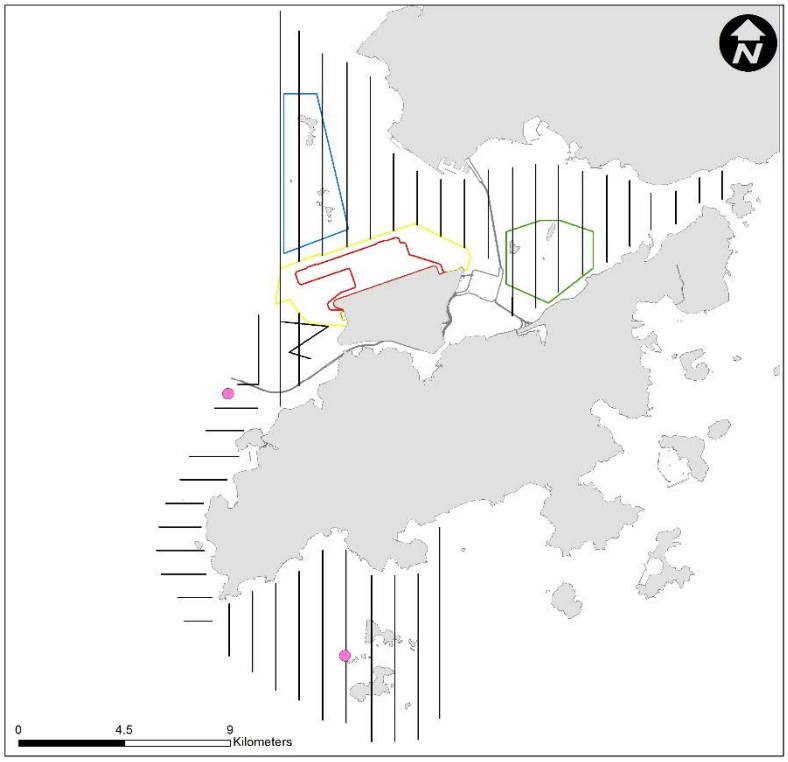
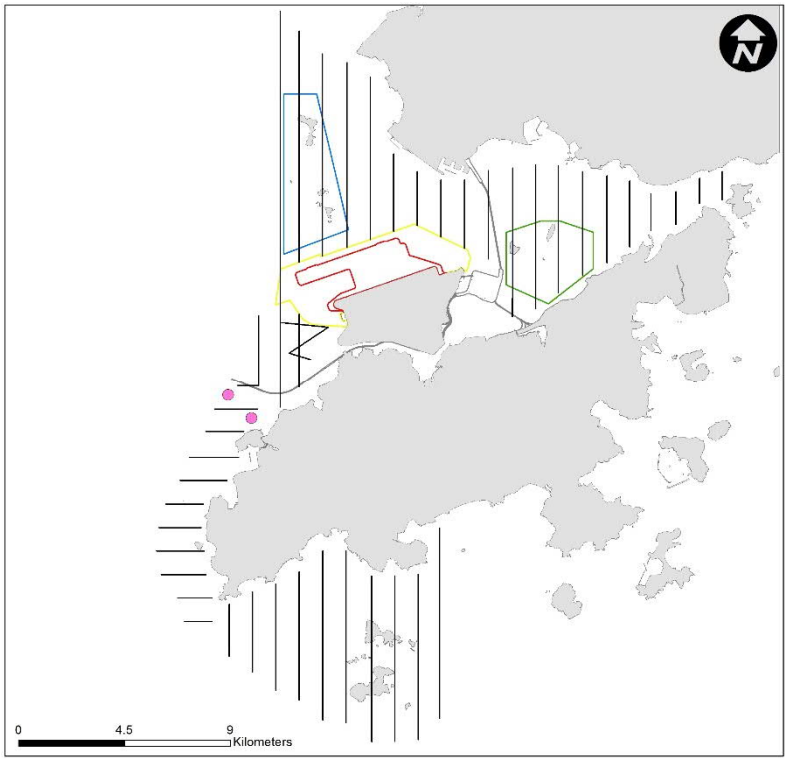


WLMM079

WLMM100

WLMM101



CWD Land-based Theodolite Tracking

CWD Groups by Survey Date

Date	Station	Start	End	Duration	Beaufort	Visibility	No. of Focal Follow	Dolphin Group Size
5/Jul/17	Lung Kwu Chau	8:39	14:39	6:00	2-4	1	0	N/A
10/Jul/17	Lung Kwu Chau	8:44	14:44	6:00	2	2	5	1-6
14/Jul/17	Lung Kwu Chau	8:46	14:56	6:10	2-3	1	4	1-4
21/Jul/17	Sha Chau	8:46	14:46	6:00	2-3	2	0	N/A
24/Jul/17	Sha Chau	8:39	14:39	6:00	2	2	0	N/A
17/Aug/17	Lung Kwu Chau	8:39	14:39	6:00	2	2	2	2-4
18/Aug/17	Sha Chau	8:49	14:49	6:00	1-2	2	0	N/A
21/Aug/17	Lung Kwu Chau	9:10	15:10	6:00	2	2-3	6	1-6
22/Aug/17	Lung Kwu Chau	8:43	14:43	6:00	2-4	4	3	2-5
25/Aug/17	Sha Chau	8:46	14:46	6:00	2	2	2	1-2
6/Sep/17	Lung Kwu Chau	8:46	14:26	5:40	2	2-3	13	1-5
18/Sep/17	Lung Kwu Chau	8:42	15:02	6:20	2-3	3	4	1-3
22/Sep/17	Sha Chau	9:11	15:11	6:00	2-3	2	0	N/A
27/Sep/17	Lung Kwu Chau	8:51	14:51	6:00	2-3	3	6	1-4
28/Sep/17	Sha Chau	8:40	14:40	6:00	2	2	0	0

Visibility: 1=Excellent, 2=Good, 3=Fair, 4=Poor

Appendix E. Summary of Ecological Monitoring Results

Ecological Monitoring – site photos and location map regarding the monthly ecological monitoring for the egretry area on Sheung Sha Chau and the HDD works

Photo record of View 1

Photo record of View 2

Appendix F. Selected Photos of Tagged Corals from Ad-hoc Monitoring

Sample Photos of Control Corals at the Recipient Site in Yam Tsai Wan	Sample Photos of Translocated Corals at the Recipient Site in Yam Tsai Wan